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Photo by Amita Sarkar

A rescued Gyps vulture by local people at Keetham, Agra.



Photo by Mansoor Mazhar

White Crested Kingfisher



Photo by Mansoor Mazhar

Indian Rollar (Nilkanth)

EDITORIAL

Recently, Ministry of Environment, Forestry and Climate Change, Govt. Of India, has given directives to declare certain Wild animals as “Vermin” as they have been found to be destructive towards agricultural crops. These animals are mainly Nilgai, Monkey, Wild boars and Elephants, besides some others. The Ministry has proposed the culling of these animals to save the agricultural crops, particularly in the States of Bihar, Uttarakhand, Himachal Pradesh and Uttar Pradesh. Besides destruction of crops, the problem of human-animal conflict is on the rise with many cases of animal attack, particularly by Leopards, are being reported from many states of India.

The question that arises out of both situations is: why this is happening? We need to realize that these wild animals once lived in forests that are slowly but steadily being encroached by human beings. The trees in forests are being cut rampantly in the name of progress and development, besides natural causes, often many incidences of forest fires are man-made. After all, animals are the natural resource of any nation and deserve due respect and protection of the Government.

If the population of a particular animal is on the rise and affecting the livelihood of humans in the region, a properly planned and supervised culling may be implemented in order to curtail the animal population. The main purpose of culling is to keep check of an animal species population by eliminating the older and weaker member of the group. The other option that may be considered is translocation of the wild animals to those parts of the country where their population has drastically reduced. If we can implement this, we can attain a uniform density of the population, of the particular species, say Nilgai. We should not forget that earlier animals could freely migrate across the country; with the emerging townships and road and train networks, their natural migratory corridors have been blocked by us the humans.

This has led to the problem of Elephants invading human habitation and Leopards attacking residents around the forests. In days to come, unplanned and unsupervised culling may actually lead to complete extinction of the species that are being labeled as “Vermins” today. We must have proper guidelines to control animal population as well as handling of man-animal conflict which should be implemented in such a way that all species including us, the human, can live in harmony with each other as well as Mother Nature.

In addition to above, the present issue has been dedicated to unique Avi Fauna which is an integral part of eco system.



Dr. S.P. Singh
Chief Editor

OBITUARY



Prof. Jaswant Singh Bali
(18.12.1923 & 21.01.2016)

With utmost grief we would like to that our life member Prof. J.S.Bali is no more. He passed away on January 21, 2016. He was the life member of our Wildlife Preservation Society India, since its inception. Born on December 18, 1923 in a farmer family of village Gharota (near Pathankot) in Punjab, he obtained his degrees of Bachelor of Science from Lahore and Bachelor of Science (Agril , Engg.) from Allahabad (Uttar-Pradesh).

He was the Head of Soil Conservation Research & Training Centre, Kaulagarh, Dehradun, Professor at Indian Institutes of Technology, Kharagpur, Head of Soil & Water Conservation Division of Ministry of Agriculture, and United Nations Consultant in Bulgaria, West Indies, Rome and Malaysia.

Prof. J.S. Bali will be remembered for his keen interest in the conservation of wildlife and natural resources, his work on reclamation of gullied waste lands in Bihar in Damodar Valley Corporation in the 1950s are well known. He did pioneering work in the field of soil conservation and introduced the concept of watershed management for the national program of conservation and management of natural resources. He created the expanded version of the All India Soil and Land Use Survey. He was a staunch advocate of bio-diversity conservation and was always ready to undertake any work of the Society. He was a great wildlife enthusiast and a good photographer. Also he was a creative thinker, writer and poet. He devoted his entire life towards conservation and sustainable use of natural resources. He last attended the Annual General Meeting of WPSI on 9th august, 2015, in which he suggested the ways to make our Society a force to reckon with. He was awarded with many citations and was given highest awards of soil conservation. He was well known for his integrity, honesty and devotion.

As the life member of WPSI, he will be remembered and his absence would be felt by the members of the Society. We pray to the Almighty God to give eternal peace to his departed soul and strength to the bereaved family. We pay a heartfelt homage to Prof. J.S. Bali.

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DISCLAIMER

"Cheetal" - Quarterly Journal founded in 1959, is published by Wildlife Preservation Society of India. The journal is intended as a medium for communication and discussion of important issues that concern wildlife activity. All articles published in "Cheetal" including editorials, research papers, observations and commentaries, letters and book reviews are deemed to reflect the individual views of authors and not the official points of view of editors and executive members of society.

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SAVE VULTURES -GYPS SPECIES AND THEIR CONSERVATION

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ABSTRACT

Vultures are large bodied birds adapted for soaring flight in thermals. To take flight from ground, vultures has to run first Gyps species are long-lived. The maximum recorded life span of Eurasian Griffon (*Gyps fulvus*) in captivity is 37 yrs (Newton, 1979). They reproduce slowly, reach the breeding age in four to six years and produce first one egg in each breeding season. They are nature's most efficient scavengers. They are known to occur in cities, towns, villages, forests and open grasslands. Vultures seldom attack healthy animals. They mainly consume carcass flesh. Particular characteristics of many vultures is a bold head, devoid of normal feathers. This helps to keep the head clean when feeding. Though a repulsive creature at close quarters, vultures glide effortlessly in the sky in the very embodiment of graceful motion (Salim Ali, 1996). There are total 23 species of vulture. In which 16 are of old world vultures and 7 are new world vulture.

INTRODUCTION

About Gyps species

Vulture is the name of a bird that mainly preys on dead animals and occasionally hunts its own quarry. It is found across the word, with the exception of Antarctica and Oceania. Vultures are basically divided into two groups, namely, Old world vultures and New world vultures. The former belong to the family acipitridae and are found inhabiting Africa, Asia and Europe. The latter, on the other hand, belong to the family Cathartidae and are mainly seen in the warm and temperate areas of the America. (Mundy et al., 1992).

Kingdom	: Animalia
Phylum	: Chordata
Class	: Aves
Order	: Falconiformes
Size	: 60 to 140 cm (24 to 55 inches)
Wingspan	: Up to 3 m (10 feet)
Weight	: Up to 12 kg (25 lb.)
Diet	: Animal carcasses
Natural Habitat	: Throughout the world, except the continents of Antarctica and Oceania
Age	: 15 to 20 years
Age of Maturity	: 5 to 7 years
Number of Eggs	: One

List of Old World and New World vulture species

Old World vultures:

- Eurasian Black Vulture or Monk Vulture, *Aegypius monachus*
- Lammergeier or Bearded Vulture, *Gypaetus barbatus*
- Palm-nut vulture, *Gypohierax angolensi*
- Griffon vulture, *Gyps fulvus*
- Indian White-Rumped vulture, *Gyps bengalensis*
- Rüppell's vulture or Rüppell's griffon vulture, *Gyps rueppelli*
- Long-billed Vulture or Indian Vulture, *Gyps indicus*
- Slender-billed Vulture, *Gyps tenuirostris*
- Himalayan Griffon Vulture, *Gyps himalayensis*
- White-backed Vulture, *Gyps africanus*
- Cape Griffon, *Gyps coprotheres*
- Hooded Vulture, *Necrosyrtes monachus*
- Egyptian Vulture, *Neophron percnopterus*
- Red-headed Vulture, *Sarcogyps calvus*
- Lappet-faced Vulture, *Torgos tracheliotus*
- White-headed Vulture, *Trigonoceps occipitalis*

New World vultures, including condors:

- Turkey Vulture, *Cathartes aura*
- Greater Yellow-headed Vulture, *Cathartes melambrotus*
- Lesser Yellow-headed Vulture, *Cathartes burrovianus*
- King Vulture, *Sarcorhamphus papa*
- American Black Vulture, *Coragyps atratus*
- California Condor, *Gymnogyps californianus*
- Andean Condor, *Vultur gryphus*

Distribution

In the wild the Old World vultures require open spaces and sources of lift to achieve soaring flight. They are therefore found most commonly in either mountains or plains and savannahs in hotter climate.

The *Gyps* vultures are distributed throughout Africa, Europe and Asia, with none above latitude 50 degrees north. *Gyps* vultures were typically widespread and abundant, accounting for the majority of individual vulture sightings in both Africa (c. 90%) and Asia (c. 99%) (Houston, 1985). There are a total of nine species of vulture found in South Asia. Four of the *Gyps* vulture species are only found in Asia. These are Oriental white backed vulture (*Gyps bengalensis*), Long-billed Vulture (*Gyps indicus*), Slender-billed Vulture *Gyps tenuirostris* and Himalayan Griffon Vulture (*Gyps himalayensis*). Eurasian Griffon Vulture (*Gyps fulvus*) breeds in Eurasia but migrates to Africa and South Asia. The geographic ranges of these vultures overlap (Pain et al., 2003). However, Chhangani 2004 have recorded, seven species in and around jodhpur in western Rajasthan, India, viz. The King Vulture (*Sarcogyps calvus*), Cinereous Vulture (*Aegypius monachus*), Egyptian Griffon (*Neophron percnopterus*), Eurasian Griffon

(*Gyps fulvus*), Himalayan Griffon (*Gyps himalayensis*), Long-billed Vulture (*Gyps indicus*) and White-rumped Vulture (*Gyps bengalensis*). Until recently their huge abundance in India could be explained by the enormous availability of food in the form of domestic cattle and buffalo carcasses that are, for religious reasons, usually not consumed as meat. In some ecosystems *Gyps* vultures feed predominantly on the carcasses of wild rather than domestic ungulates. For example, in the Serengeti, Tanzania, high population densities of *Gyps* are present and consume more than a quarter of the available ungulate carcasses (Houston, 1985).

Habit and Habitat and distribution

Vultures perform a vital role in nature's sanitation processes by tearing meat from carcasses before it rots. While feeding themselves they prevent the spread of disease which would affect other mammals, including humans survival and a low juvenile survival (Amadon, 1964). They are also highly sensitive to environmental changes (Houston, 1985).

The Oriental White-backed Vulture (*Gyps bengalensis*) prefers cultivated tracts with scattered houses and refuse tips offer more opportunity for obtaining food (Roberts, 1991). Houston (1985) described *Gyps* species as being responsible for a greater consumption of meat than any of the mammalian carnivores.

The Cinereous Vulture (*Aegypius monachus*) breeds very sparsely throughout Balochistan and tribal areas of North-West Frontier Province. There is some migration of birds to lower Sindh in winter and to the Thar and Cholistan deserts and the Potohar plateau around Rawalpindi. In the late 1950s, 30 Cinereous Vulture (*Aegypius monachus*) could be counted on Karachi municipal refuse dumps in Ghizri creek area. 15 to 20 birds could be seen in summer around Ouetta rubbish dumps in early 1970s. They leave their wintering grounds by mid-February and returns to their nesting haunts on the higher junipers studded crags on Pakistan western borders (Roberts, 1991). 52 eggs of Cinereous vulture (*Aegypius monachus*) from Balochistan had been taken; all were at elevation of 3,048 meters or higher and collected between 10 March and 27 March. 38 were on cliffs and 14 on the crown of Juniper (*Juniperus macropoda*) trees. 34 of these eggs came from the Koh-i-murdar Range which is relatively bare of Junipers which might account for the high proportion of nests on the cliff ledges. Most of these were collected during 1930s and early 1940s and about one-third was white all over and unspotted. A fully fledged young bird was taken from a nest on the Khojak ranges near Chaman at the end of May (Roberts, 1991).

The Eurasian Griffon (*Gyps fulvus*) breeds throughout Balochistan and parts of Sindh, Kohistan and the Salt Range. It is comparatively rare in the north parts of Balochistan during mid-winter, in winter time numbers migrates to the Indus plains. They migrate down to the warmer foothills and plains in winter, where they sympatric with the White-backed vultures, (*Gyps bengalensis*). They breed exclusively on mountain cliffs, spending the spring and summer months in the arid steppic mountain regions of Balochistan (Roberts, 1991). Although the literature suggests that vultures have been common birds in South Asia (Roberts, 1991; Gilbert et al., 2002). The drastic decline of three species of *Gyps* vultures Oriental White-backed (*Gyps bengalensis*),

Long-billed (*Gyps indicus*) and Slender-billed (*Gyps tenuirostris*) in South Asia over the past decade is probably the first of its kind. These three species are now listed as critically endangered (Birdlife International, 2001).

The establishment of 'nursery' areas, where juveniles congregate prior to breeding, is a not uncommon feature (Mundy et al., 1992). Foraging flights for the south Asian vultures may be lower than in other species, possibly due to the high availability of carcasses removing the need to travel long distances in search of food. Advances in radio and satellite tracking are providing new information all the time. These management guidelines have been developed for vultures from the genus *Gyps*, and in particular the three critically endangered species of *Gyps* vultures found in South East Asia. Although many aspects will be relevant to other species of vultures, the bulk of this study refers specifically to this genus.

Population decline

Since early 1990's, a catastrophic population crash has occurred in three species; the slender billed vulture (*Gyps tenuirostris*), the Indian or long billed vultures (*Gyps Indicus*), and the white rumped vulture (*Gyps bengalensis*). Once numbering in the tens of millions throughout India. These Asian vultures have declined by over 99 percent and currently number less than 10,000. The pace of decline is so great (about 48 percent per year) that these three species may not survive the next decade. Few factors such as lack of food, poisoning pesticides heavy metal contaminants persecution, viral disease have caused population collapse at local level but none have been shown to cause massive population collapse.

The causes for this precipitous decline was not known until 2004. It had been assumed that a vital infection was spreading through earth species, but autopsies of the dead birds revealed the presence of white crystals on several internal organs. These crystals are made up of uric acid, the same chemical responsible for gout in humans. After an extensive investigation of the more common source of vultures mortality such as firearms and lead poisoning. Then it was determined that there was no connection between those vultures deaths from whatever caused the gout like symptoms and vultures deaths from other causes.

Additional research revealed in 2004 that the animals that had gout like symptoms showed high levels of an anti-inflammatory drug called diclofenac in their systems. This drug is the major cause of vultures mass mortality is diligence contamination of live stock carcasses (Oaks et al., 2004; Green et al., 2004; Shultz et al., 2004). However other causes such as habitat destruction, food storage human persecution, poisoning & pesticide use may have caused a gradual decline in vulture population in the region (Bird life international, 2001).

Declaration of Diclofenac and vulture conservation

Recently scientific evidence indicates that diclofenac (a non-steroidal anti-inflammatory drug) is a major cause of vulture decline. Exposures of vultures to diclofenac arises through its veterinary use to treat domestic livestock. Experiment shows that vultures are highly susceptible to diclofenac and are killed by feeding on carcass of an animal soon after it has been treated with normal veterinary dose of drug.

Declines of Gyps species in South Asia, Indian populations have declined by 95% within the past decade, a rate of decline unprecedented among common raptors in its rapidity and one that appears to be continuing (Prakash et al., 2003). There are several possible explanations for high mortality and reduced breeding success of Gyps species in southern Asia including food storage, persecution, contaminants and infectious disease.

CONSERVATION

Vultures play an important ecological role through rapid consumption of animal carcasses. The loss of a major scavenger from the ecosystem will affect the balance between populations of these scavenger species and result in increased putrefying carcasses. The decline in vulture population has resulted in an increase in number of putrefying animal carcasses and changes in the scavenger population in rural as well as urban areas. This has resulted in associated disease risks for wild life, livestock and humans.

Anthropogenic disturbances leading to destruction of suitable roosting and nesting trees as well as disturbance have a marked impact on vultures and their survival. The general public is ignorant of the ecological importance of vultures. Conservation efforts cannot be successful without the active involvement of local communities.

Alternatives of diclofenac

Diclofenac in the a world wide pharmaceutical market : Diclofenac is a non-steroidal anti-inflammatory drug (NSAID) used for variety of painful and inflammatory conditions. Based on reports received from pharmaceutical industry, the annual total veterinary pharmaceutical market in the country, as per 2003 estimates, is about Rs. 1000 Cr. The non-steroidal anti-inflammatory segments accounts for Rs. 30 Crores, of which diclofenac has a market of Rs. 20 Crores, with an expected annual growth rate of 10%. The number of animals being treated annually with diclofenac ingestibles alone is projected at about 100 million.

Constraints in Phasing out veterinary use of Diclofenac:

Human use of Diclofenac

A major issue in the phasing out of veterinary use of diclofenac is its use in human medicine as an effective anti-inflammatory and analgesic. While there is no reported human medical condition for which diclofenac is the sole, effective anti-inflammatory analgesic, it is nevertheless true that it is an extremely effective drug in human use (Teng, 2005). Also it is possible that a very small number of persons may experience adverse effect with all the close substitutes, and thus may only be administered diclofenac. It is thus not feasible to completely phase out human use of diclofenac, in addition to its veterinary use. So long as human use continues, and so long as human diclofenac is a cost effective substitute alternative to veterinary alternatives of diclofenac.

Considering that the balance of societal well-being considerations would require the conservation of vultures through preventing exposure to diclofenac while retaining human use of diclofenac, a way must be found to prevent diversion of human diclofenac to veterinary use. Since veterinary use of drugs are known to be very sensitive to consideration of cost, a feasible approach would be to ensure through appropriate policy

instruments, that human diclofenac is too costly for general veterinary use. If there are some extremely poor patients who may only be treated by diclofenac, a way must be found to subsidize diclofenac use in these cases .

Testing Meloxicam as an alternative drug for diclofenac

Since the three resident Gyps species in Asia (*G. bengalensis*, *G. indicus*, and *G. tenuirostris*) were critically endangered and schedule/ species under the wild life (Protection) Act, 1972 and too rare and too endangered for extensive safety testing.

A phased programme of safety testing for an alternative drug, Meloxicam, was observed in vultures at any administered dose. There was no loss of body weight related to treatment, all blood parameters measured remained within their normal ranges, and there was no significant sub-lethal effects. Meloxicam was thus found to be safe at 2.5 x LD₅₀ of diclofenac for a group of test animals . The LD 50 is one way to measure the short-term poisoning potential (acute toxicity) of a material. To increase confidence in safety of Meloxicam a larger sample of vulture was required to be treated with Meloxicam at an estimated maximum level of exposure (MLE). All birds survived at a higher dose of Meloxicam and no loss of body weight was observed over 7 days. All blood parameters measured remained within their normal range (at 2 and 7 days after exposure).

Further trials provides strong evidence that Meloxicam is a safe alternative, better than diclofenac for the treatment of livestock with reduced risk (Swan, 2006). A collaborative project between forest department, Haryana, IVRI and BNHS with technical inputs from RSPB was started in 2005 at the vulture conservation and breeding centre at Pinjore, Haryana for conducting safety trials on Meloxicam (Swaroop et al. 2007).

Conclusion is that oral administration of Meloxicam at a dose equal to or more than the amount may be considered a safe for vultures.

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A rescued Gyps vulture by local people at Keetham, Agra.

NOTES ON BREEDING BIOLOGY OF WHITE CRESTED KALIJ PHEASANT

Lophura leucomelana hamiltonii (Gray)

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Abstract:

The present paper provides information about breeding behaviour of White crested kalij pheasant. In district Pauri Garhwal, Uttarakhand breeding activities of kalij starts from February onward when pair formation between adult male and female first time was observed. Territorial fights between males, and chasing between male and were observed in the months of March and April respectively. In the May four active nests with average diameter 23.1 and depth 9.54 centimetres were located in the open or in the burrows of tree trunk. All nests were made up of dry leaves, grass and litter. The clutch size was 4-8 eggs from which 69.75% eggs were hatched out. The total chick survival was recorded 56.25%. Sexual dimorphism appeared in the months of September and October.

Key Words: Aves, Avifauna, Birds and Ornithology

Introduction:

The pheasants are the forest dwelling game birds. These are magnificently coloured birds known to mankind since prehistoric period for their food and other values. Out of total 51 species of pheasants reported so far in the world, 17 species are found in the South East Asia. Among all the pheasants, Kalij pheasant *Lophura leucomelana* (Gray) is the most widely distributed, found in the Himalaya from river Indus in the western Pakistan, east ward through northern India to Nepal (Ali and Ripley 1983). Of the 13 sub species of Kalij, the White crested kalij pheasant *L. l. hamiltonii* is a very common species found from 400-3600m altitude in the subtropical deciduous forests and mixed temperate forests (Hermans 1986, Bisht and Dobriyal 2002, Bisht *et al* 2002). Within its distributional range once this species was most common. But in the last few years illegal hunting, trapping and wide scale habitat destruction caused overall decline in its population among other wild animals. As a result, now Kalij has been categorised at 'Lower risk' by IUCN. Apart from the studies conducted on its occurrences, distribution, habitat use, population, social behaviour (Kumar *et al* 2014); information on breeding biology would help in management of this species.

The aim of the present study was to provide detail information on breeding biology including pairing, territory formation and courtship, nesting, clutch size, hatching success and appearance of sexual dimorphism of the White crested kalij pheasant.

Materials and methods:

The study was conducted from the year 2007 to 2011 in the district Pauri Garhwal (30° 15' N and 78°30' E) of Uttarakhand state. In the local dialect of Garhwal Himalaya, Kalij is called 'Kukhera, Kala murga or murgi'. The habitat where present study was carried out has been comprised mixed temperate forest (dominant trees were *Pinus* sp., *Quercus* sp. *Rhododendron* sp. etc) between 1600-2000m altitude range. Minimum and maximum daily temperature during the study period was 6.2°C and 18.5°C and 12.7°C

and 22.7°C respectively. Annual average rainfall was 142.41mm³, mainly brought by South - West monsoon (June-September).

During the study, information was collected on group size, territory formation, pair formation, mating, and nesting, clutch size, hatching success, parental care and appearance of sexual dimorphism. Using the focal plot method (10 metre radius), information collected on vegetation cover (viz., canopy, shrub, herbs, grass cover and height) and litter depth within 10m distance of nests.

Each nest was visited at fixed interval of 2-3 days and records maintained on shape and size of nests, nesting materials used in the nest formation, number and colour of eggs, hatching success, chicks survival, breeding success, parental care, appearance of secondary sexual characters and associated behaviour.

Observation and discussion:

Pairing and territory formation: White crested kalij is a social bird found in the group of 2 to 12 or more birds. From February onward Kalij was observed in pair or small groups of 2 to 2.56 consisting one male and one female or one male, one female and one sub adult pheasant. After pairing, the territory formation noticed in early spring when male to male chasing was observed. During this period drumming sound produced by male Kalij was also noticed. A courtship was observed on mid April (on 17th April). After a long chasing the male pheasant mounts the female just like domestic fowl mounts the hen.

Nests and nest site characteristics: During the study, four active nests were located between 800 to 1900m altitudes on North east, south east and south facing slopes of 25° inclination (Table 1). Nests were found in the open in shallow scrapes, under pits below the hollow tree trunks. The vegetation cover around the nests was little. The median score for vegetation was as - canopy cover 37.5%, shrubs 35.8%, herbs 27.7%, grass 12% and litter depth was 2.8cm. The grass height was recorded about 15cms.

Average size of nests was recorded as follows: diameter 23.1cm and depth at centre was 9.5cm. All nests were made up of dry leaves and grass with average 82% and 9.5% respectively. Average distance of nests from nearest escape site (hiding cover) was 15.8 meter far.

Clutch size and breeding success: Mean clutch size of four nests was 6.5 eggs (consisting 8 eggs in 2 nests, 6 eggs in one nest and 4 eggs in one nest (Table 1, Fig. 1c and d)). The eggs were pale cream or buffy white to warm reddish buffy, almost very similar to the eggs of domestic fowl. Two eggs from one nest (IV nest) were picked up by the villagers in our absence who used the habitats for grazing their cattle. From remaining eggs of four nests, 69.75% chicks hatched. Since we had no data on date of egg laying, the incubation period was not recorded here. Chick survival and breeding success records were 42.7% and 56.25% respectively. All chicks were small, generally chestnut colored (Figure 1e).

Parental care and appearance of sexual dimorphism: After hatching chicks were observed with female (mother hen). Female keeps her chicks under the wings till few days and remain near the breeding habitat. Once chicks become larger, female with her chicks cover large area for feeding. Initially all chicks had almost similar brown plumage but by September end few chicks observed with black and white feathers. And by October they completely turn to adult males which have black plumage with white

feathers on crest, throat and rump. Some of birds most probably the females remain with brown plumage.

A finding of present study reveal that the White crested kalij is an early breeder. Like other galliforms and many passerine birds (Ali and Ripley 1963) egg laying occurs before arrival of the monsoon in the month of May. This could be a reproductive strategy against monsoon because chances of fungal infection (in eggs) and predation pressure increase several times (Chandola-Saklani *et al* 1983) during the monsoon time. Breeding hen and eggs could be easily detected by predators ingreen background colour (Jimenez and Canover 2001, Bisht *et al* 2005). Data on nest site characteristics indicate that the vegetation cover is least concerned for nesting whereas role of litter observed important. The brown plumage of nesting hen easily camouflage with a brown background litter.

A clutch size of 6.5 (4 - 8) eggs found in the present study is comparatively lower than 6 - 9 and up to 15 eggs reported by Hume and Marshal (1879), Singh and Singh (1995). In Chantikhhal reserve forest (750-1200m) in Pauri Garhwal, an average clutch size of 11.12 with chick survival (37.09%) has been reported by Sharma (1992). Change in the Clutch size and breeding success can be attributed to various factors like invertebrate abundance (Hill 1985).

Habitat destruction especially through forest fire occurrences during spring and summer seasons (when egg laying, incubation and hatching of chicks occur) the drought conditions prevail, has become regular phenomenon. Forest fire is mostly man-made, occurred due to intentional or reckless acts committed by human being, and caused primarily to obtain good growth of grasses.

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Table -1

Parameters	Nest No.				Mean $\pm$ S.E
Months	I	II	III	IV	
	May	June	June	July	
1.Habitat characteristics					
Altitude (m)	1900	1850	1800	810	
Aspect	SE	S	NE	SE	
Slope angle (degree)	22	38	15	24	24.7 $\pm$ 4.8
Distance of nest from hiding cover/ escaping habitats (m)	25.0	10.5	10.0	18.0	15.8 $\pm$ 3.5
2.Vegetation characteristics around nests					
Habitat types	MTF	MTF	MTF	MDF	
Canopy cover (%)	50.0	25.0	50.0	25.0	37.5 $\pm$ 7.2
Shrub Cover (%)	44.4	36.4	27.2	35.2	35.8 $\pm$ 3.5
Grass Cover (%)	16.4	12.1	14.6	17.2	15.0 $\pm$ 1.1
3.Nests location, size, and composition					
Location with respect to ground	In a shallow scrape	In a pit below shrub stem	In a pit below tree stem	In a shallow scrap	
Diameter (cm)	22.0	21.0	28.1	20.4	23.1 $\pm$ 1.7
Depth (cm)	9.7	10.2	10.9	7.5	9.5 $\pm$ 0.7
Leaves (%)	98.0	65.0	92.0	75.0	82.5 $\pm$ 7.5
Rubbish (%)	2.00	55.0	8.00	25.0	22.5 $\pm$ 11.8
Litter depth (in cm)	3.4	2.3	4.1	1.6	2.8 $\pm$ 0.5
4. Reproductive success					
Clutch size	8	6	4	8	6.50 $\pm$ 1.10
Hatching success (%)	87.50	66.44	50.00	75.00	69.75 $\pm$ 7.87
Chick survival (%)	75.00	50.00	25.00	75.00	56.25 $\pm$ 11.96
Breeding success (%)	50.00	33.00	25.00	62.00	42.70 $\pm$ 8.39

MTF- Mixed temperate forest, MDF- mixed deciduous forest.

Photo by Dr. Sunit Kumar & Dr. M.S. Bisht



a) A group of Kalij consisting one adult male one female and two sub adults



b) Female Kalij sitting on her nest



c) A clutch size of four eggs



d) A clutch of five eggs



e) Three chicks of Kalij in a nest

Some observations on the birds of Solan, Himachal Pradesh

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Abstract

Solan is located in Himachal Pradesh, mostly hilly landscape comprised of mid Himalayan and Shivalik ranges.

Present article is based on my observations on birds carried out during my stay at Solan from June 2010 to July 2015. Analysis of data revealed that area supports the occurrence of a sizable number of avian species, comprised of both residents and migrants. Total 116 species of birds belonging to 13 orders and 45 families were recorded in the present study including some rare/ interesting records, besides a few species remained unidentified due to inadequate observations. Most dominant family was Muscicapidae, represents 12 species followed by family Accipitridae represents 7 spp and family Phasianidae and Cuculidae with 6 spp, each. Species such as European Linnet *Carduelis cannabina*, Egyptian Vulture *Neophron percnopterus* and Bonelli's Eagle *Aquila fasciata* were very rare. Habitat degradation and increasing antropogenic pressure are the major threats for the sustainability of avifauna of thisu area.

Key words: Solan, Birds, Avifauna, Songbirds, Himachal Pradesh.

Introduction

Solan (30.05° to 31.15° N, 76.42° to 77.20° E) is one of the twelve districts of Himachal Pradesh, having an area of 1936 Km² and divided into four sub-divisions namely Solan, Nalagarh, Arki and Kandaghat. The area is mostly hilly, comprised of mid Himalayan and Shivalik ranges. The forests comprised of Ban Oak *Quercus incana*, mixed with Chir Pine *Pinus roxburghii* at lower altitudes. Rhododendron *Rhododendron arboreum* forms pure stands in places and Cedar *Cedrus deodara* and Blue Pine *Pinus wallichiana* have been planted in some areas. There is little mature forest, and much secondary growth due to disturbance (Champion and Seth 1968, Gaston and Singh 1980). Well known Chail Wildlife Sanctuary occupies some areas of Solan district. It is one of the best sanctuaries for the occurrence of Cheer Pheasant *Catreus wallichii*. The Sanctuary has, within its boundaries, Chail town and numerous villages, and is connected by a forest corridor to the Shimla Water Catchment Sanctuary in the north. It comprises part of the catchment area of a tributary of the Giri River (Islam and Rahmani 2004).

At least 139 bird species have been reported from the area (Naim Akhtar *pers. comm.* 2003), including five species of pheasants, such as Cheer *Catreus wallichii*, Koklas *Pucrasia macrolopha*, Kalij *Lophura eucomelanos*, Peafowl *Pavo cristatus* and Red Junglefowl *Gallus gallus*. Cheer Pheasant occurs only in grassland, Kalij and Koklas occur in oak forest.

Major species of the Sino-Himalayan Temperate Forest can be seen in the area, such as Himalayan Tree Creeper *Certhia himalayana*, Black-capped Sibia *Heterophasia capistrata*, Orange-flanked Bush Robin *Tarsiger cyanurus*, Blue headed Redstart

Phoenicurus caeruleocephalus, Green Backed Tit *Parus monticolus*, and White-browed Rosefinch *Carpodacus thura*. The Plain-backed Thrush *Zoothera mollissima*, listed by BirdLife International in Eurasian High Montane is also observed in Chail. It is found between 2,700 to 4,000 m but winters between 900 to 2,600 m (Ali and Ripley 1987). The birds such as Himalayan Slaty-headed Parakeet *Psittacula himalayana*, Black-throated Jay *Garrulus lanceolatus*, Himalayan Bulbul *Pycnonotus leucogenys* and Grey-winged Blackbird *Turdus bouboul* can also be seen in this area.

Methodology

During my stay at Solan from June 2010 to July 2015, I regularly monitored the avifauna of the area in terms of bird-watching and photography. Most observations were made in Solan town and adjacent localities (such as Subathu Road, kandaghat, Barog, Ochghat, salogra and Giripul) within 10-15 km radius. Two to four days (with some exceptions) every month were spent for bird watching, except opportunistic observations as and when done. During the field work, observations on birds were made 3 to 4 hours per day between early morning to late evening (6.00 am to 6.00 pm; with few exceptions), with the help of prismatic field binocular (10x50) and digital photography camera. For the identification of some species, vocalizations were also recorded. For this purpose, vocal signals of target species were recorded with the help of Marantz Digital Audio Tape Recorder PMD 670 and Audio-Technica unidirectional shotgun microphone. Avisoft SAS Lab Pro was used for the generation of spectrograms for species identification. Identification of species was carried out with the help of field guide of Birds of India written by Kazmierczak and Perlo (2000) and a pocket guide to the birds of the Indian Subcontinent by Grimmett *et al.* (2003). The taxonomic order and nomenclature followed Clements 6th edition, updated 2014 (Clements *et al.* 2014). IOC World Bird List (Gill and Donsker 2014) was also considered.

Results and Discussion

Total one hundred and sixteen species of birds belonging to 13 orders and 45 families were recorded in the present study (Appendix-I) including some rare/interesting records, besides a few species remained unidentified due to inadequate observations. Most dominant family was Muscicapidae, represents 12 species followed by family Accipitridae represents 7 spp and family Phasianidae and Cuculidae with 6 spp, each. Species such as European Linnet *Carduelis cannabina*, Egyptian Vulture *Neophron percnopterus* and Bonelli's Eagle *Aquila fasciata* were very rare. These seen only once. It seems that these were vagrant in the area. Species belonging to finches, rosefinches, redstarts and wagtails are winter migrants. The area is rich in songbirds. Out of 116 species, 67 were songbirds belonging to thirty families under order Passeriformes. Habitat degradation and increasing antropogenic pressure are the major threats for sustainable avifauna of the area.

Review of literature revealed that avifauna of the area is not well documented. However some studies have been carried out on the birds of Solan. 85 avian species belonging to 66 genera spread over 30 families and 12 orders were reported from Arki area of Solan district (Thakur *et al.* 2010). 117 species of birds belonging to 43 families and 14 orders were reported from Mandala Watershed area of Solan (Thakur *et al.* 2012).

Birds of Nauni Campus of University of Horticulture and Forestry located in Solan, were also studied (Narang and Singh 1995). Seasonal change of bird species in two different altitudinal locations of Solan District were studied by Sharma and Mahabal (1997). 93 species of birds belonging to 9 orders and 26 families were observed from different areas of Solan district (Singh 2015). At least 139 bird species have been reported from the area (Naim Akhtar *pers. comm.* 2003). As per a study carried out by Akhtar and Narang (2002), Cheer pheasant is quite abundant in Chail. However, I could not identify its presence in Solan area except, few calls in Chail Wildlife Sanctuary area. It seems that decades back this species was quite common in the area, but during recent years its population has decreased drastically most probably owing to habitat loss and grass cutting by locals for their domestic use. On the basis of present study and earlier records, it can be concluded that area supports fairly good populations of avian species. It may be due to favourable climatic conditions, existence of fine patches of forests/ vegetation and non-harming attitude of locals towards nature and wildlife. Efforts should be continued to maintain the sustainability and diversity of birds of this area.

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Appendix I: List of birds observed during the study in Solan town and adjacent areas.

S. no.	Common Name of the species	Scientific Name	Migratory status	IUCN Status	Tentative Abundance
ORDER: GALLIFORMES					
Family: Phasianidae					
1	Grey Francolin	<i>Francolinus pondicerianus</i>	R	LC	C
2	Black Francolin	<i>Francolinus francolinus</i>	R	LC	B
3	Jungle Bush-Quail	<i>Perdicula asiatica</i>	R	LC	C
4	Red Junglefowl	<i>Gallus gallus</i>	R	LC	A
5	Kalij Pheasant	<i>Lophura leucomelanos</i>	R	LC	A
6	Indian Peafowl	<i>Pavo cristatus</i>	R	LC	A
ORDER: SULIFORMES					
Family: Phalacrocoracidae					
7	Little Cormorant	<i>Phalacrocorax niger</i>	R/ LM	LC	B
ORDER: PELECANIFORMES					
Family: Ardeidae					
8	Intermediate Egret	<i>Mesophoyx intermedia</i>	R	LC	B
9	Cattle Egret	<i>Bubulcus ibis</i>	R	LC	B
10	Indian Pond-Heron	<i>Ardeola grayii</i>	R	LC	C
ORDER: ACCIPITRIFORMES					
Family: Accipitridae					
11	Black-shouldered Kite	<i>Elanus caeruleus</i>	R	LC	C
12	Egyptian Vulture	<i>Neophron percnopterus</i>	R/ LM	EN/ scarce	C
13	Himalayan Griffon	<i>Gyps himalayensis</i>	R	NT	A
14	Steppe Eagle	<i>Aquila nipalensis</i>	WM	LC	B
15	Bonelli's Eagle	<i>Aquila fasciata</i>	R/ LM	LC	C
16	Shikra	<i>Accipiter badius</i>	R	LC	A
17	Black Kite	<i>Milvus migrans</i>	R	LC	A
ORDER: CHARADRIIFORMES					
Family: Charadriidae					

18	Red-wattled Lapwing	<i>Vanellus indicus</i>	R	LC	B
ORDER: COLUMBIFORMES					
Family: Columbidae					
19	Rock Pigeon	<i>Columba livia</i>	R	LC	A
20	Oriental Turtle-Dove	<i>Streptopelia orientalis</i>	R/ SM	LC	A
21	Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	R/ SM	LC	B
22	Spotted Dove	<i>Streptopelia chinensis</i>	R	LC	B
23	Wedge-tailed Pigeon	<i>Treron sphenurus</i>	R	LC	C
ORDER: CUCULIFORMES					
Family: Cuculidae					
24	Common Hawk-Cuckoo	<i>Hierococcyx varius</i>	R	LC	A
25	Indian Cuckoo	<i>Cuculus micropterus</i>	R	LC	A
26	Common Cuckoo	<i>Cuculus canorus</i>	SM	LC	B
27	Himalayan Cuckoo	<i>Cuculus saturatus</i>	SM	LC	B
28	Asian Koel	<i>Eudynamis scolopaceus</i>	SM	LC	A
29	Greater Coucal	<i>Centropus sinensis</i>	R	LC	A
ORDER: STRIGIFORMES					
Family: Strigidae					
30	Collared Scops-Owl	<i>Otus lettia</i>	R	LC	C
31	Asian Barred Owlet	<i>Glaucidium cuculoides</i>	R	LC	A
ORDER: APODIFORMES					
Family: Apodidae					
32	Common Swift	<i>Apus apus</i>	SM	LC	A
33	House Swift	<i>Apus nipalensis</i>	R	LC	A
ORDER: CORACIIFORMES					
Family: Alcedinidae					
34	Common Kingfisher	<i>Alcedo atthis</i>	R/SM	LC	B
35	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	R	LC	A
36	Pied Kingfisher	<i>Ceryle rudis</i>	R	LC	B
Family: Meropidae					
37	Blue-bearded Bee-eater	<i>Nyctornis athertoni</i>	R	LC	C
38	Green Bee-eater	<i>Merops orientalis</i>	R	LC	A
39	Blue-tailed Bee-eater	<i>Merops philippinus</i>	SM	LC	B
Family: Upupidae					
40	Eurasian Hoopoe	<i>Upupa epops</i>	R	LC	A
ORDER: PICIFORMES					
Family: Megalaimidae					
41	Great Barbet	<i>Megalaima virens</i>	R	LC	A
42	Blue-throated Barbet	<i>Megalaima asiatica</i>	R	LC	A
Family: Picidae					
43	Brown-fronted Woodpecker	<i>Dendrocopos auriceps</i>	R	LC	A
44	Himalayan Woodpecker	<i>Dendrocopos himalayensis</i>	R	LC	A
45	Scaly-bellied Woodpecker	<i>Picus squamatus</i>	R	LC	A

	ORDER: PSITTACIFORMES				
	Family: Psittacidae				
46	Alexandrine Parakeet	<i>Psittacula eupatria</i>	R	NT	B
47	Rose-ringed Parakeet	<i>Psittacula krameri</i>	R	LC	A
48	Himalayan Parakeet	<i>Psittacula himalayana</i>	R	LC	A
49	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	R	LC	B
	ORDER: PASSERIFORMES				
	Family: Campephagidae				
50	Scarlet Minivet	<i>Pericrocotus speciosus</i>	R	LC	B
	Family: Oriolidae				
51	Indian Golden Oriole	<i>Oriolus kundoo</i>	SM	LC	B
	Family: Dicruridae				
52	Black Drongo	<i>Dicrurus macrocerus</i>	R	LC	A
	Family: Rhipiduridae				
53	White-throated Fantail	<i>Rhipidura albicollis</i>	R	LC	B
	Family: Monarchidae				
54	Asian Paradise-Flycatcher	<i>Terpsiphone paradisi</i>	SM	LC	B
	Family: Corvidae				
55	Eurasian Jay	<i>Garrulus glandarius</i>	R	LC	B
56	Black-headed Jay	<i>Garrulus lanceolatus</i>	R	LC	B
57	Red-billed Blue-Magpie	<i>Urocissa erythrorhyncha</i>	R	LC	A
58	Grey Treepie	<i>Dendrocitta formosae</i>	R	LC	A
59	Large-billed Crow	<i>Corvus macrorhynchos</i>	R	LC	A
	Family: Hirundinidae				
60	Red-rumped Swallow	<i>Cecropis daurica</i>	SM/ R	LC	A
	Family: Stenostiridae				
61	Grey-headed Canary-Flycatcher	<i>Culicicapa ceylonensis</i>	SM	LC	A
	Family: Paridae				
62	Great Tit	<i>Parus major</i>	R	LC	A
63	Green-backed Tit	<i>Parus monticolus</i>	R	LC	A
64	Black-lored Tit	<i>Parus xanthogenys</i>	R	LC	A
	Family: Aegithalidae				
65	Black-throated Tit	<i>Aegithalos concinnus</i>	R	LC	A
	Family: Sittidae				
66	White-tailed Nuthatch	<i>Sitta himalayensis</i>	R	LC	B
	Family: Tichodromidae				
67	Wallcreeper	<i>Tichodroma muraria</i>	WM	LC	B
	Family: Certhiidae				
68	Bar-tailed Treecreeper	<i>Certhia himalayana</i>	R	LC	A
	Family: Pycnonotidae				
69	Red-vented Bulbul	<i>Pycnonotus cafer</i>	R/ LM	LC	A
70	Himalayan Bulbul	<i>Pycnonotus leucogenys</i>	R	LC	A

71	Himalayan Black Bulbul	<i>Hypsipetes leucocephalus</i>	R/ LM	LC	A
	Family: Phylloscopidae				
72	Common Chiffchaff	<i>Phylloscopus collybita</i>	WM	LC	B
73	Blyth's Leaf-Warbler	<i>Phylloscopus reguloides</i>	SM	LC	B
74	Grey-hooded Warbler	<i>Phylloscopus xanthoschistos</i>	R	LC	A
	Family: Cisticolidae				
75	Striated Prinia	<i>Prinia crinigera</i>	R	LC	A
	Family: Zosteropidae				
76	Oriental White-eye	<i>Zosterops palpebrosus</i>	R	LC	A
	Family: Timaliidae				
77	Black-chinned Babbler	<i>Cyanoderma pyrrhops</i>	R	LC	B
78	Rusty-cheeked Scimitar-Babbler	<i>Megapomatorhinus erythrogenys</i>	R	LC	C
	Family: Leiothrichidae				
79	Jungle Babbler	<i>Turdoides striata</i>	R	LC	A
80	White-crested Laughingthrush	<i>Garrulax leucolophus</i>	R	LC	B
81	Streaked Laughingthrush	<i>Trochalopteron lineatum</i>	R	LC	A
	Family: Muscicapidae				
82	Indian Robin	<i>Copsychus fulicatus</i>	R	LC	C
83	Oriental Magpie-Robin	<i>Copsychus saularis</i>	R	LC	B
84	Verditer Flycatcher	<i>Eumyias thalassinus</i>	SM	LC	B
85	Blue Whistling-Thrush	<i>Myophonus caeruleus</i>	R	LC	A
86	Spotted Forktail	<i>Enicurus maculatus</i>	R	LC	B
87	Ultramarine Flycatcher	<i>Ficedula supercilialis</i>	SM	LC	C
88	Plumbeous Redstart	<i>Phoenicurus fuliginosus</i>	R	LC	C
89	White-capped Redstart	<i>Phoenicurus leucocephalus</i>	R/ WM	LC	B
90	Blue-capped Redstart	<i>Phoenicurus caeruleocephala</i>	R	LC	C
91	Pied Bushchat	<i>Saxicola caprata</i>	SM/ R	LC	B
92	Grey Bushchat	<i>Saxicola ferreus</i>	R	LC	B
93	Indian Chat	<i>Cercomia fusca</i>	R	LC	B
	Family: Turdidae				
94	Orange-headed Thrush	<i>Geokichla citrina</i>	SM	LC	C
95	Tickell's Thrush	<i>Turdus unicolor</i>	SM/ PM	LC	C
96	White-collared Blackbird	<i>Turdus albocinctus</i>	R	LC	B
97	Grey-winged Blackbird	<i>Turdus boulboul</i>	R	LC	B
98	Red-throated Thrush	<i>Turdus ruficollis</i>	WM	LC	C
	Family: Sturnidae				
99	Jungle Myna	<i>Acridotheres fuscus</i>	R	LC	A
10	Common Myna	<i>Acridotheres tristis</i>	R	LC	A

0					
	Family: Dicaeidae				
10 1	Fire-breasted Flowerpecker	<i>Dicaeum ignipectus</i>	R	LC	C
	Family: Nectariniidae				
10 2	Purple Sunbird	<i>Cinnyris asiaticus</i>	SM/ R	LC	B
	Family: Prunellidae				
10 3	Altai Accentor	<i>Prunella himalayana</i>	WM	LC	B
10 4	Rufous-breasted Accentor	<i>Prunella strophiate</i>	WM	LC	B
	Family: Motacillidae				
10 5	Grey Wagtail	<i>Motacilla cinerea</i>	WM/ PM	LC	B
10 6	White Wagtail	<i>Motacilla alba</i>	WM/ PM	LC	B
10 7	Olive-backed Pipit	<i>Anthus hodgsoni</i>	SM	LC	B
	Family: Emberizidae				
10 8	Chestnut-breasted Bunting	<i>Emberiza stewarti</i>	WM	LC	B
10 9	Chestnut-eared Bunting	<i>Emberiza fucata</i>	WM	LC	C
	Family: Fringillidae				
11 0	Common Rosefinch	<i>Carpodacus erythrinus</i>	PM/ WM	LC	B
11 1	European Goldfinch	<i>Carduelis carduelis</i>	WM	LC	B
11 2	Eurasian Linnet	<i>Carduelis cannabina</i>	WM	LC	C
11 3	Fire-fronted Serin	<i>Serinus pusillus</i>	WM	LC	C
	Family: Passeridae				
11 4	House Sparrow	<i>Passer domesticus</i>	R	LC	B
11 5	Russet Sparrow	<i>Passer rutilans</i>	R	LC	C
	Family: Estrildidae				
11 6	Nutmeg Mannikin	<i>Lonchura punctulata</i>	R	LC	C

Abbreviations: WM-Winter Migrants; SM-Summer Migrants; PM-Passage Migrants; R-Residents; LM-Local Migrant or Vagrants; LC-Least Concern; NT-Near Threatened; VU-Vulnerable; EN-Endangered; A-Mostly Seen; B-Occasionally Seen; C-Rarely Seen.

Note: For migratory status, if a species is mostly resident through its distribution range and summer migratory/ winter migratory in a small area, it was marked as R/ SM or R/ WM, respectively. If species is WM/ SM in larger areas and resident in smaller areas, it was marked as WM/ R or SM/ R, respectively.

Photo by Dr. Anil Kumar



1: Blue-throated Barbet, *Megalaima asiatica*.



2: Great Barbet, *Megalaima virens*.



3: Himalayan Bulbul, *Pycnonotus leucogenys*.



4: Streaked Laughingthrush, *Trochalopteron lineatum*.



5: Red-Headed Tit, *Aegithaliscus concinnus*.

Sighting of a Leucistic Himalayan Bulbul *Pycnonotus leucogenys* from Sonanadi Wildlife Sanctuary, Uttarakhand, India.

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Albinism and partial albinos are the well documented color aberrations in birds. So far, it has been recorded in more than 400 avian species (Gross 1965, McCardle 2012). However, total albinism (in which all the feathers, bill, cere, talons, and eyes are without melanins; e.g., Sheffield 1992, Delordet *al.* 2012) in birds is relatively rare. While, partial albinism is relatively common and occurs when pigment is reduced or absent from the skin, feathers, or eyes (e.g., Cortés-Avizanda 2010, Tinajero and Rodríguez-Estrella 2010). Leucism is a form of incomplete partial albinism, in which the colour of eyes, legs and bill remains same as in normal individuals, while body plumage is either totally colourless or with decreased pigmentation (Sage 1962, Forrest and Naveen 2000).

In Indian context, albinism has been reported in some species such as in Grey Heron *Ardeacinerea* (Inglis 1903), Grey-backed Shrike *Laniustephronotus* (Dudgeon 1904), House Sparrow *Passer domesticus* (Tiwari 1930), Jungle Crow *Corvus macrorhynchos* (Sar 1987, Mahabal 1991), Little Brown Dove *Spilopelia senegalensis* (Javed 1992) and Asian Pied Starling *Sturnus contra* (Sharma 2001). In bulbuls, it is reported in some species such as Red-vented Bulbul *Pycnonotus cafer* (Baker 1915, Law 1921, Chatterjee 1995, Joshua 1996).

During a faunistic survey to Sonanadi Wildlife Sanctuary, Uttarakhand, on the evening of 04.06.2016, when we were returning from field work, at a location about 300 m east to Halduparao Forest Guest House (29°39'04.15" N and 78°44' 22.43" E; altitude: 392 m) I saw a white coloured bird. Seeing it, I understood that it an albino bird. Without wasting time in observations, I took several photographs for further identification and evidence. This individual was bit far from us and it was dusk (6.15 pm), so I could not take very clear close-ups, owing to low light and distance. Screaming of some elephants in background restricted my movement towards this individual and finally we were compelled to move from this area.

Careful perusal of the images (Fig. 1A & B), confirmed the identity of this bird as Himalayan Bulbul *Pycnonotus leucogenys*. It has almost white body plumage with blackish beak, grayish-black tarsus, cere and lores, and tail of the individual also had grayish shade. The vent (under-tail coverts) was light yellow. All of observed characteristics revealed that it was a leucistic or partial albino Himalayan Bulbul. Review of literature on internet revealed that albino Himalayan Bulbul has been observed earlier, too (www.indianaturewatch.net/displayimage.php?id=284921). However, sightings are not common. The sighting of albino Red-whiskered Bulbul *Pycnonotus jocosus* has also been revealed on the net. (www.indianaturewatch.net/displayimage.php?id=187771).

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Photo by Dr. Anil Kumar



Photo-1: (A) Image of the leucistic Himalayan Bulbul *Pycnonotus leucogenys*.



(B) Image is showing the colour of vent of individual. (Images taken by Dr. Anil Kumar, ZSI)

Prehatching behavior of Sarus Crane (*Grus antigone* *antigone*) in Auraiya distt. of Uttar Pradesh.

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ABSTRACT

The observation on prehatching and nesting behavior of Sarus Crane (*Grus antigone*) in Auraiya distt. Uttar Pradesh was made. An increase of the nest size by adding with nesting material before hatching (prehatching) was observed in three nests out of 30 nests during the breeding period.

Key Words: Aves, Sarus Crane, Hatching, Nest, and Behavior

INTRODUCTION

Many workers studied on the nesting behaviors of Sarus Crane, *Grus antigone* *antigone*. (Mukherjee 1999) and (Sunder and Choudhary, 2005). We have observed a prehatching behavior of Sarus Crane in Auraiya distt. of Uttar Pradesh. Auraiya distt. lies entirely in the gangetic plains, but its physical features vary considerably and are determined by the rivers which cross it. It is situated between 26°21' to 26°01' North latitude and 78°45' to 79°45' East longitude. The total geographical area of distt. is 254.4 square kilometer which is 6.45% of the total area of U.P.

METHOD

Observation on breeding pairs of Sarus Crane was carried out in three blocks of Auraiya distt. namely block Auraiya, block Bhagya Nagar and block Achhalda. The breeding season start from first week of August and till last week of November (according to arriving of monsoon). During present study, 30 nests were observed in breeding season. The prehatching behavior was observed only in three nests. All the nests were visited regularly during whole incubation period. Most of the observations were made through naked eye as well as with the help of binocular and from hide close to nests.

OBSERVATION

During present study, the observations were made directly close to one nest, which was situated in paddy field Narottampur village (26.48N, 79.51E) of Auraiya block, for the incubation period. It was found that both parents were busy increasing the size of nest. This typical behavior was noted. The parents were trying to increase the size of nest just before hatching.

In this behavior, parents were seen very active and alert. They searched nest material available close to the nest (like paddy plant and grasses). Both birds pickup the nest material through beak and put in the nest. So the size of nest increases more and more. Average time observed during this process was between 25 to 35 minutes. After this activity, parents were again busy in incubation.

Similar type of behavior was also observed in two other nests during breeding period in the same season. One nest situated in paddy field, Kakhoutu village (26.48N, 79.15E) and second nest situated in the wetland, Saraiya village (26.42N 79.54E). This behaviour was observed in successive years.



Photo-Showing prehatching behavior

No of nests	Nest place	Material used	Time taken for nesting of activity (Minutes)	Hatching time after nesting activity	
				1 st egg	2 nd egg
First	Paddy field	Paddy plants	30 to 35 (limit)	7 hours	13 hours
Second	Paddy field	Paddy plants and grasses	27 to 32	6 hours	17 hours
Third	Wetland	Aquatic weeds and grasses	25 to 35	9 hours	24 hours

RESULT

All the nests were found in water logged areas which having two clutch size. During whole study period it was found that there was difference of about 24 hours between 1st and 2nd egg laying. The hatching period was more or less same i.e. 34± days. The first egg of nest hatched 09 hour after preaching behavior study period and second egg hatched 24 hour after this behaviour.

The increasing of size of the nest before 24 hour of hatching is prehatching

behaviour of Sarus Crane. It is performed by parents during period of incubation. The prehatching behaviour is a common behaviour before the hatching of eggs.

DISCUSSION

On the basis of studies of earlier workers, the similar observation was made regarding the nest material and the hatching period by Singh and Khan, 1989 and Mukherjee et al 2002. The observation regarding increasing of the nest size before hatching was not recorded by any earlier worker.

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The conservation of natural resources is the fundamental problem. Unless we solve that problem it will avail us little to solve all others

Theodore Roosevelt

Culling is not the best solution

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The recent culling of Neelgai in Bihar has caused much uproar all over the country. Suddenly everyone is talking about Culling . I have heard all sorts of comments from callous, moderate to severe. One even had a religious angle to it where a gentleman commented that a Nawab had shot down hundreds of Neelgai in a cow state. I had to subsequently explain to him that though the Nawab was the team leader , his team members were all Hindus and also tell him that a Neelgai is not a bovine but an antelope. Such an overreaction is quite understandable in a country where hunting was banned more than three decades ago.

Since I have personal experience in the matter, I take this opportunity to put across a few points which I have understood over the years.

First and foremost , I would like to point out (sentiments set aside) that Culling is an integral part of Wildlife Management all over the world.

Having said that I would also like to clarify certain aspects which have to be considered and are essential to make the entire operation successful. I will hereby give examples from across the world to make us understand Culling better.

Let us first start with Argentina. A large country with a sparse population. In Argentina certain species were introduced eg Red deer, Fallow deer, Multihorn sheep, Black buck and Cheetal. These species have adapted and multiplied to the extent that they have to be culled regularly. For all indigenous species a special permit is required which in most cases is not easy to get. This ensures a balance between introduced and indigenous species.

Rabbits in Australia is another such example. Rabbits were introduced by the white man. Over the years they have multiplied so much that they have to be regularly culled. It is common for hunting teams to shoot down thousands of rabbits in one hunt. Their population has grown exponentially and has become a threat to the local species of marsupials and other animals.

In England, the largest predator is the Red Fox. Every farmer has to plant a certain number of trees on his land to compensate for the carbon footprints caused by development projects. The increasing deer population adversely effect the plantations and certain number of deer have to be culled regularly to ensure survival of the saplings. Roe deer (breeding does) produce two fawns in a year. So 30% have to be culled annually to maintain their population. In thickly forested private land even 60% of visible deer are culled because majority of the deer stay hidden in the forests. All sick, diseased animals and those with genetic defects are also eliminated.

There was a time when elephant hunting in Assam was legal. A trophy hunter shooting a tusker was entitled to the tusks only after he managed to shoot a tuskless makhna within 3 months of shooting a tusker. This ensured a healthy gene pool where

tuskless males were artificially removed from the system.

In Africa, before the onset of a (predictably) dry season, when food and water are scarce, weak and sick animals are selectively culled to reduce the pressure on land and to ensure survival of healthier animals.

How does one adapt Culling as a practical solution to the Indian scenario. Having hunted in South Africa, being on culling expeditions to Argentina and England and dealt with man animal conflict in India. Here are some point I would like to make.

In India, with its ever growing human population, we have to be very careful when we declare animals Vermin . A scientific approach should be followed without which the delicate balance between man and animals will be disturbed. Let me take the example of Neelgai and how this can be achieved.

First and foremost, a count has to be conducted annually. This can be done in the summers when the fields are devoid of crops and tall vegetation. Neelgai being the largest antelope in India can easily be counted and a detailed count according to sex and age be maintained in every district. The count should be repeated again after a year and a study of damage caused on agricultural produce correlated with the increase in population. Every piece of land has a holding capacity. If the numbers increase more than the holding capacity . Permits should be issued to cull the animals. Unlike trophy hunting where only big males are selectively shot. Culling involves shooting down of an equal number males and females apart from sick, old animals alongwith those who have genetically defects.

In Texas , a trophy Neelgai fetches US\$2000/=. The Nawab and his team shot around 250 Neelgai in three days. That's approximately US\$50 0000 worth Neelgai. The Forest Dept as well as the local community can earn revenue from auctioning the Culling permits for Neelgai. This can not just earn revenue but also make the farmer more tolerant to the animal, who presently feels its financial worth as nothing more than a crop raider .

If done in a proper and scientific manner, culling will not only raise funds for the local community, it will ensure more tolerance from the farmers towards Neelgai and most importantly reduce the human-animal conflict .

Do You Know?

- ✦ Hesperornis is a fossil bird.
- ✦ Wandering Albatross has the largest wing span.
- ✦ Komodo Dragon can attain maximum length up to 3 meters.
- ✦ Jean Paul Getty award is also known as the 'Nobel Prize for Conservation'.
- ✦ Great Rann of Kutch is the largest nesting site for greater flamingo in Asia.
- ✦ About forty thousand species of spiders are found in the world.
- ✦ Pavo' journal is devoted to Indian Ornithology.
- ✦ The Newt is the only representative of tailed amphibian in India.
- ✦ The elephant tusk is a modified incisor teeth.
- ✦ India and Bhutan share boundaries of Manas Tiger Reserve.

Compiled by: Naresh C. Madhwal.

*From The Archives Of " Cheetal"***FAUNAL DIVERSITY AND ITS CONSERVATION IN GARHWAL HIMALAYAS****Dr. P.C. TAK**

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I.INTRODUCTION:-

It is a well-known and well established biological fact that the external make-up or morphological aspect (the phenotype) of an individual is simply the result of environmental modification of the genetic make-up (the genotype) of the individual. According to the IUCN (International Union for Conservation of Nature and Natural Resources) 1980, our earth supports something like 5 to 10 million species of plants and animals which have evolved over the period of 3 billion years through the various biological processes such as mutation, recombination and natural selection.

The Indian region (8°- 30° N and 60°-97.5°s) with a total area of 329 million hectares is indeed very rich in biological diversity (all plants, animals and micro-organisms of major socio-economic value for human survival). It is estimated that about 45,000 species of plants occur in this country. The vascular flora, which forms the conspicuous vegetative cover, itself, comprises 15,000 species, of which more than 60% are endemic and have so far not been reported anywhere else in the world. The region is equally rich in fauna. More than 50,000 species of insects, 4,000 of molluscs, 6,500 of other invertebrates, 2,000 of fish, 140 of amphibians, 420 of reptiles, 1,200 of birds and 340 of mammals (i.e. 65,000 spp. Of animals) are recorded from this country (Khoshoo, 1986).

The followings are the two main reasons for this remarkable diversity of life forms in this country (i) the great diversity of ecosystems-almost every major type of habitat is to be found here (e.g. from the areas of the heaviest rainfall to the driest desert, sea level etc.) and (ii) the position of the Indian sub-continent of African, Mediterranean, European, Sino-Japanese and Indo-Malayan elements in the fauna and flora in India.

Similarly, because of its geographical position between plains of India and highland of Tibet (Central Asia) and the great altitudinal variations (303 m in south to 7816 m in north) embracing varied topography and vegetation, the Garhwal Himalayas also exhibit an enormous variety of habitats. This in turn reflects the faunal (animal) diversity of the region, as detailed under a separate heading-Faunal Diversity.

ii. Area

The Garhwal Himalayan region, an area of 30,090 km², is geographically situated between the co-ordinates of 29°27'-31°33' N latitudes and 77°48'-80°06' E longitudes. It comprises five districts, viz, Dehradun, Tehri, Puri, Uttarkashi and Chamoli of Uttar Pradesh. The largest glacier, namely Gangotri glacier, of the region of ca 26 km lengths is situated in district Uttarkashi. The Ganges formed by the confluence of the Bhagirathi and the Alakanda at Devprayag, controls the drainage. The altitude raised

from ca 303 m (1,000) in the south to ca 7816 m (25,645') in the north. A narrow belt of bhabar (porous detrital pied Mont) skirts the hills in the south.

As the altitude increases the forest type changes from Tropical Moist deciduous forest at lower altitudes through subtropical pine Forest, Moist alpine scrub to Dry alpine scrub at higher altitudes.

iii. Faunal Diversity

The dictionary meaning of the word FAUNA is the assemblage of animals of a region or period. To introduce in brief, zoologically, this assemblage of animals can broadly be classified into two major animal divisions, viz., Invertebrates (animals without backbone) and vertebrates (animals with backbone). Both of which are further divisible into various Phylum's such as: Protozoa, Porifera, Coelentrata, Helminthes, Annelida, Arthropoda, Mollusca, Echinodermata (Invertebrates) and Pisces, Amphibia, reptilia, Aves, Mammalia (vertebrates). Each of which is again divisible into several classes, orders families, genus, species (kinds) and subspecies (subkinds).

In the subject of Zoology (the science of animals) it is not uncommon to come across volume (s), on a single family of these animals, written by various experienced animal taxonomists. Thus no article or book on faunal diversity of any small region (e.g. Garhwal Himalayas) can be satisfactory unless it accounts for all the various foregoing animal sections.

Although the pioneer Zoological research institute like the Zoological survey of India and also the numerous Zoology departments of various universities are working tirelessly for the last many decades and have had collected/recorded the representative specimens of all the aforesaid phylums, except the echinoderms which are purely marine animals, from Garhwal region. But up to the present; it has not received the attention it deserves, probably due to the difficult approach and hostile weather conditions in the higher reaches of the region.

However, on the basis of whatever information is available in the existing Zoological literature coupled with the author's own field experiences in the region gained during 1981-85, 1988 to date an attempt is being made to handle the faunal diversity of the region.

About 60 species of mammals, 400 species and subspecies of birds, 40 species of reptiles, 20 of amphibians and 60 of fishes (vertebrates) and about 120 species of odonata, 70 species of termites, 11 species of centipedes (invertebrates) (pers. Comm. With various scientists of ZSI, Dehradun) are known to occur in Garhwal region.

Although the region is a mountainous one, the habitat-type changes as the altitude rises, and each habitat-type supports its own distinctive type of biotic communities. To illustrate the over all known animal diversity it is preferred here, for the sake of convenience and from the layman's point of view, to detail the various animals (selected groups only) under the following two broad categories. Viz., low land animals and high land (altitude) animals.

A. Low Land Animals of the region : (Altitude ca up to 1000 m or 3300')

Habitat: Siwalik foothills and valleys in lower altitudes in the lesser Himalayan

range constitute this habit. It is dominated by the Sal (shorearobusta) trees, the other common associate tree being: Rohini (Mallotus Philippensis); Amla (Embelica sp.); Jamun (Syzygium sp.); Pipal, Bargad, Lakar, Khaibar etc. (Ficus sp.). Presence of Savannah is another interesting feature of this habitat.

Fauna: The low and fauna of the region is very rich and diverse, as described notable feature about the low mammalian fauna is the survival of some populations of the following depleted species:

1. The Tiger, *Panthera tigris*.
2. The Leopard Cat, *Felis bengalensis*.
3. The Hog-Dear, *Axis porcinus*.
4. The Indian Pangolin, *Manis crassicaudata*.

Among the more popular mammals are : Panther or Leopard (*panther pardus*), Jackal (*Canisaureus*), common Fox (*Vulpes*), Rhesus Macaque (*Macaca mulata*), Langur or Entellus monkey (*presbytis antellus*), Sloth Bear (*melursus ursinus*), Black Bear (*Selenarctos tibetanus*), Common otter (*Lutra lutra*), common palm Civet or Today cat (*Paradoxurus hermaphroditus*), Himalayan Palm civet (*Paguma larvata*), Mongoose (*Herpestes edwardsi*), Jungle cat (*Felis chaus*), Indian Elephant (*Elephas maxmus*), Nilgai or Blue Bull (*Boselaphus tragocamelus*), Spotted-Dear (*Axis axis*), Sambar (*Cervus unicolor*), Barking Dear (*Muntiacus muntjak*), Wild Boar (*Sus scrofa*), Porcupine (*Hystrix indica*), Bandicoot Rat, Bush Rat, Field Mouse, House Mouse, House Rat, Indian Gerbil, Indian Hare, Hedgehog, Shrew, Flying Fox, Fruit Bat, Pipistrelle etc.

ii. Birds : More than 350 species and subspecies are known to exist. The notable feature about the avifauna of this habitat is that it attracts a large number of migratory birds. About 90 spp. And subspp. Of various types of migrants such as winter visitors (e.g. Great Crested Grebe, White or Rosy Pelican, Black Stork, Brahminy Duck, Common Shelduck, Common Teal, Redcrested Pochard and Gulls etc.). summer visitors (e.g. Indian Cuckoo, Brahminy myna, Verditer Flycatcher, Paradise Flycatcher and Indian Purple Sunbird etc), altitudinal migrants (e.g. Cattle Egret, Bearded Vulture, Wood-Cook, Slatyheaded Parakeet, Rufousbellied woodpecker etc.), passage migrants (e.g. European Kestrel, Purple Moorhen Avocet, Green Pigeon and Redbreasted Parakeet etc.) and local migrants (e.g. Lapwing, Plover, Bengal Green Pigeon, Blossomheaded Parakeet etc.) have been reported from the Corbett National Park area falling district Pauri Garhwal (Kumar and Lamba, 1985).

The raptors or birds of prey include various types of kites, falcons, sparrow-hawks, kestrels, eagles, owls. Owlets etc.

The pheasants like red jungle fowl, common pea fowl, kaleej, and the partridges inhabit scrub forests.

A large number of Passeriformes birds such as : Broadbills, Larks, Shrikes, Orioles, Drongos. Minivets Crows, Magpies, Jays, Babblers, Warblers, Thrushers, Flycatchers, Chats, Sunbirds, Nuthatches, Tree-creepers, White-eyes, and Weaver birds etc. are found in diverse ecological niches of this habitat.

iii. Reptiles : More than 20 spp. of reptiles (12 snakes, 8 lizards and 3 tortoises) are reported to inhabit all the ecological niches of this habitat. The outstanding feature of the reptilian fauna is the occurrence of four largest (in size) and threatened species of Indian reptiles, viz, Gharial (*Gavialis gangeticus*), Crocodile (*Crocodylus paulistis*), Python (*Python molurus*) and the king cobra (*Ophiophagus hannah*).

iv. Amphibians : About 15 species of amphibians are known to occur in various ecological niches of this habitat. Among the commonest being *Bufo* and *Rana* species.

v. Fishes : More than 30 species of fishes are found in different rivers, streams, ponds and marshes of this habitat. The commoner one being Mahasheer, Rohu, Trout etc.

B. High land/altitude animals of the region : (Altitude ca above 1000 m or 3300')

Habitat : As the altitude rises the tree-canopy changes from pine-Oak-Rhododendron (*Pinus*, *Quercus*, *Rhododendron* respectively) through Deodar (*Cedrus*), Fir (*Abies*), *Rhododendron* (*R. Campanulatum*) to Birch (*Betula utilis*) (Temperate Forests up to ca 11,000'). At still higher elevation, i.e. more than 11,000' or 12,000', the alpine meadows are composed of numerous shrubs (e.g. *R. anthopogon*, Juniper, *Salix* species); herbs (e.g. *Aconitum*, *Cynanthus* and *Polygonum* spp.); and grasses (e.g. *Danthana*, *Festuca* and poa species).

Fauna : The high land/altitude fauna exhibits adaptations to a number of high altitude exological factors like atmospheric cold, aridity, intense insolation, radiation and snow cover, and progressive attenuation of air and humidity with increase in altitude. As a result their bodies are covered their dense hair which protect them from the severe atmospheric cold. The colour of their body is usually dull and light which provides resistance to these animals against intense insolation and radiation. Thus indeed these animals have a resilience which the low land animals often lack (Tak and Lamba, 1985).

Further, on account of brief flowering and fruiting seasons of alpine meadows and inhospitable climatic conditions the animals having experienced short-summer (July-September) either shift to lower adjoining valleys in temperate forests or hibernate during winter.

(i) Mammals: Extreme climatic conditions are inhospitable to animal life. This is illustrated by the fact that lesser faunal diversity is available at high altitudes. About 15 species of mammals are known to exist in this habitat. Of which five (viz, Langur, Panther, Black Bear, Goral and Martin) due to their wide distributional range and greater adaptability to varied environment, occur at low altitudes also. The exclusive representative of high land being: snow Leopard or Ounce (*Panthera uncia*), Brown Bear (*Ursus arctos*), Musk Deer (*Moschus moschiferous*), Himalayan tahr (*Hemitragus jemalhicus*), Bharal or Blue Sheep (*Pseudois nayaur*), Serow (*Capricornis sumatraensis*), yellow-bellied weasel (*Mustela kathia*), Royle's Pika (*Ochotona roylei*) etc. The notable feature about the high land mammals is the survival of following endangered and threatened species which have already disappeared from the neighbouring areas e.g. Snow Leopard, Brown Bear, Musk Deer, Tahr, Bharal, and Serow.

(ii) Birds: The birds diversity is also comparatively less. Only 80 species of birds could be observed in Nanda Devi National Park, ca 800 km², in district Chamoli during

1981-1985 (Lamba, 1985). At least the following eight species are endangered or threatened, viz, Himalayan Golden Eagle (*Aquila chrysaetos*). Eastern Steppe Eagle (*Aquila rapax*), Black Eagle (*Ichneutes malayaensis*), Himalayan Bearded vulture (*Gypaetus barbatus*), Chir Pheasant (*Carteus wahichii*), Western tragopan (*Tragopan melanocephalus*), Himalayan Monal Pheasant or Impeyan (*Lophophorus impejanus*) and koklas (*Pucrasia macrolopha*). The more common hill birds being : European Kestrel, Chukor Partridge, Himalayan Snowcock, Woodcock, Snow Pigeon, Doves, Himalayan Great Barbet, Garhwal Pied, Woodpecker, Redbilled Chough, Yellow-billed chough, Nutcracker, Laughing Thrush Longtailed Minivet, Redstart, Forktails, Garhwal alpine Accentor, Tits, Tree Creepears, Grosbeak, Rosefinch and Pine Bunting etc.

(iii) **Reptiles:** The exclusive representative of high altitudes among lizards are : e.g. Himalayan Skink (*Leiopisma himalayana*), Rock Lizard (*Agama tuberculata*), Himalayan Lizard (*Agkrotosdon himalayana*) and among snakes are : e.g. Himalayan Pit Viper (*Japalusa variagata*), Cantor's Polydora Snake (*Synnophis sagittarius*) etc.

(iv) **Amphibians:** Amphibians inhabiting torrential hill streams being : *Anolops afgana*, *A. formosus* (Frogs), *Bufo himalayanus*, *Rana blanfordi* (Central Himalayan Toads).

(v) **Fishes:** *Schizothorax richardsoni* (Himalayan Trout), *Nemacheilus rupicolis*, *Tor chilinoideus*, *T. putitora* (Yellow-finned Mahasheer), *Gara gotyla* etc. constitute the exclusive representatives of hill streams fish fauna.

iv. Conservation

Although natural extinction is a part of the overall process of evolution, but the present rate of extinction is undoubtedly man-made because of the ever increasing needs (including greed) of the human kind.

Nevertheless to conserve its wildlife heritage (faunal diversity) and to maintain a pace with the World Conservation Strategy' India is sparing no efforts and is contributing its best for wildlife conservation. The followings are some of the India's contributions in the field of wildlife conservation.

1. Enactment of wildlife act (1873, 1878, 1879, 1912, 1933 & 34).
2. Setting up of Indian Board of Wildlife (IBWL) in 1952.
3. Creation of National parks and Sanctuaries (54 and 247 nos.).
4. Becoming a party to CITES (Convention on International Trade of Endangered and threatened Species of Flora and Fauna) in 1976.
5. Implementing the UNESCO'S MAB (Man and Biosphere) Programme in 1971.
6. Starting conservation project for individual endangered species of fauna like Hangul or Kashmir Stag (1970), Lion (1972), Tiger (1973), Crocodile (1974), Brown-antlered or Manipur Deer (1981).
7. Establishment of WII (Wildlife Institute of India) and starting of wildlife as a subject at both Graduate and Post-Graduate levels. All these measures, which have so far been taken, are protection oriented. While the Wildlife management, in addition, requires the following also.

1. Rehabilitation of the endangered animals

2. Scientific management of conservation areas for propagation and
3. A judicious cropping after the optimum population is achieved.

The rehabilitation programmes for animals like Rhinoceros and lions etc. are already under way, and the same is true for scientific management of conservation areas for propagation. The latter is being done by way of declaration of various biosphere reserve in which the provision for propagation of animal populations through scientific management does exist. There are 16 such already identified and proposed areas in the country. Three of which viz. Nilgiri, Namdapha and Nanda Devi have already been declared as Biosphere Reserves.

In Garhwal alone we already have one biosphere reserve (Nanda Devi Biosphere Reserve) in district Chamoli three National Parks: Valley of Flower National Park (distt. Chamoli) Corbett National Park (almost half portion in distt. Pauri) and Rajaji National Park (part in distt Dehradun) and Sanctuaries like Kedarnath and Govind Pashu-Vihar etc.

But this all is not enough the Garhwal Fauna and its diversity alone is posing a Challenge much bigger than conquering the Everest before every one of us to study.

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हिमालय क्षेत्र . उत्तराखण्ड में ओजोन परत विघटन, जलवायु परिवर्तन व दैवीय आपदा का स्वास्थ्य व जैव विविधता पर प्रभाव

डॉ० सुनील कुमार, एसोसियेट प्रोफेसर

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mYkj[k.M jkT; d fokuu ,o ik[kfxdh ifj'kn rFkk fo'ofokly; vunku vk; kx }kjk ikf'kr ifj; ktuk }kjk iorh; {k= e vktku dh ijr d fo?kVu d dkj.k vku okyh l ; d idk'k e ijkcuh&ch fdj.kk dk rhork lQ ekle e lcg 11-00 ct l lk; 3-00 ct rd gkrh ga bldh rhork xeh d ekle tykb] vxLr] flrEcj e 12-30 ct lcl vf/kd eki x; h ga Apkb c<u d l kFk&l kFk ijkcuh&ch fdj.kk dh rhork Hkh c<rh ga l kj ijkcuh&ch fdj.kk dh rjx n/ ; & 312 uuk ehVj dk okf'kd vkr ek/ ; e fofHkuu Apkb ij 0-580 & 0-990 mw/cm² d e/ ; ik; k x; ka U; ure ijkcuh&ch fdj.k fnlEcj] Qjojh ekge 0-301 mw/cm² de Apkb oky {k=k e rFkk vf/kdre 1-208 mw/cm² l kj ijkcuh&ch fdj.k vf/kd Apkb oky {k= ij tykb l flrEcj eghuk e fjikv dh x; h ga¹ de rhork okyh ijkiuh&ch fdj.k gkfudkj d ugh ga yfdu vf/kd le; rd mPp rhork dk vYVkok; yV&ch fdj.k thok d fy; gkfudkj d tkrh g rFkk budk iHko ek=k o rhork d vulkj c<r k ga bu fdj.kk dk iHko idk'k mRrtd inkFk tl jhckfyohu %foVkehu&ch% DykjDohu eyfj; k Mx] ,.Vhck; kfVd] jVhu vkfn dh mifLFkr e c< tkrk ga ikdfrd l kj fdj.kk dh ryrk e df=e ijkcuh&ch fdj.kk dk idk'k fo"kkDr %QkV& VkfD l d% iHko cgr vf/kd gkrk ga jhckfyohu uku&VkfD l d g yfdu lk; fdj.kk d lEid e vku l ; gkfudkj d %QkV&VkfD l d% gk tkrk g] DykjDohu ikdfrd l kj fdj.kk vkj df=e ijkcuh&ch fdj.kk d lEid e vkj vf/kd gkfudkj d gk tkrk ga vf/kd le; rd idk'k mRrtd d l kFk ijkcuh&ch fdj.kk d lEid e jgu l dN l {e thoj dpvk & eVQk; j iklFkek] tyh; tho MfQfu; k exuk eNyh i tfr e 0; ogkfjd 'kkjhfd o tfod cnyko ik; k x; k rFkk yok volFkk e mudh eR; gk tkrh g vktku ijr d fo?kVu d dkj.k l kj fdj.kk e c< jgh ijkcuh&ch fdj.kk dh rhork yok o l {e thok d fy; /kkrd fl) gbga²

bl ifj; ktuk d vUrxr ikdfrd rFkk df=e ijkcuh fdj.kk dk iHko ekuo dh : f/kj df.kdkvk ij

idk'kmRrtd jlk;uk dh mifLFkr e fd;k x;k tk fd fofdj.kk dh rhork] ek=k rFkk lKUnrk ij fuHkj QkVv&VkfDlykyftdy ifjoru dk n'kkrk gA vf/kd rhork vkj bld iHkko d lKfk yky jDr df.kdkvk e QkVghelykbfl l gk tkrk gA yky jDr df.kdkvk ij v/; ;u dju l fu'd'k fudyk fd ikdfrd] df=e] ijkcuxh&ch iHkko d dkj.k] vkDlhmfvO LVI d dkj.k bue ,UVhvkDlhmUV Lrj ?V tkrk g ft ld dkj.k fyfiM ijkd lhm'ku gkrk g rFkk dkf'kdk eEcu u"V gk tkrh gA Dykjkdohu dh idk'k fo"kkDrrk fjoktjyohu l vf/kd g rFkk ikdfrd ijkcuxh fdj.kk dh ryuk e df=e ijkcuxh fdj.k vf/kd gkfudkj d ikb x;hA ijkcuxh&ch fdj.kk d ,Dl iktj d dkj.k 0; ogkfjd] 'kkjhfd rFkk tfod ifjoru ik; x;A³

vkttku ijr d fo?kVu l c< jgh vYVkokbyV fdj.kk l mPp iorh; {k= dh to fofokrk dk [krjk c< jgk gA ;g v/; ;u Hke.Myh; lk;koj.k ifjoru dh nf"V l Hkh egRoi.k gA bl ifj;ktuk l lk;klr tkudkj mYkjk[k.M jkT; d fokuu ,o ik[kfxdh fohkx }kjk Hkfo"; e cukb tku okyh lk;koj.k] tyok; ifjoru LokLF;] iorh; to fofokrk l j{k.k rFkk fodkl dh ;ktukvk e egRoi.k ;kxnu inku djxhA

ikdfrd vkink d dkj.k cgr l ou; tho&tur o ik/kk dk gkfuk gkrh gA mRrjk[k.M jkT; e 9 flrEcj dk fgeky; fno l rFkk 16 flrEcj dk vkttku fno l euk;k tkrk gA ;g fgeky; d bdkfllve lk;koj.k rFkk ml ij mifLFkr itkfr;k d foylrhdj.k l cpku rFkk mud l j{k.k d fy, egRoi.k i;k l gA VfjLV rFkk lykuh tk fd cnhukFk] dnjukFk] ged.M vkfn ifo= LFkkuk] l jf{kr {k=} jk"Vh; ikd rFkk vHk;kj.;k e tkr gA mul dN [kk l tur] ouLifr Rkfk fof"V ou; thok dk [krjk cuk jgrk gA dN vk"kh; ik/kk d vR;f/kd nkgu l o foylrhdj.k d dxkj ij gA ; gh ugh dN vkfdM o Qx l Hkh vk"kh; egRo dh g rFkk foylr gk jgh gA ftudh tkudkj djuk vR;ur vko";d gA Hkkjrh; lldfr e /ke d ek/e l lk;koj.k o thok dh l j{k.k dk ldyi ckj&ckj nkgjk;k tkrk jgk gA rylh dh itk] o xk; l j{k.k] cv dh itk] ihiy dh itk vkfn&vkfn bld Toyur iek.k gA 'kkfur e= d ek/e l __f"k okkfudk u idfr d li.k ifjo'k dh 'kkfur dh dkeuk dh gA

Hkkjr fo'o Hkxkfyd {k= dk vFkk l lkj dh Hkfe dk 2-4 ifr"kr gA yfdu bldh of'od tkrh; fofokrk ;k to fofokrk %ck;Mkbof lVh% yxHkx 8 ifr"kr gA bl hf, Hkkjr fo'o d 12 egkfokfok %exck;Mk;of lVh% n'kk e fxuk tkrk gA vHkh cgr l h tkfr;k dh [kk t rFkk ukedj.k "k" gA dN okkfudk d vulkj vHkh rd fo'o dh yxHkx 25 ifr"kr tkfr;k dh gh [kk t gb gA bl vuike ;fn Hkkjr dh to fofokrk dk vydu dj rk 1 yk[k l vf/kd ikni rFkk 3 yk[k turvk dh [kk t djuk "k" gA D;k ge dHkh viuh li.k tfod lEink dh [kk t dj ldx\ ;g gekj lku i'u o pukrh gA

;g fLFkr vkj Hkh vf/kd fujk'kk tud gk tkrh g tc ge irk pyrk g fd cgr l h itkfr [kk t dju l igy gh foylr %lektr% gk jgh g rFkk dN dk foylrhdj.k dk [krjk ink gk jgk gA idfr dk to ilrdky; %ck;k ykbcj% m le mifLFkr tkfr;k d ukedj.k ,o lpic) gku l igy gh lektr gk jgk gA

tho&turvk d vkokl dk u"V gkuk foylrhdj.k dk ,d e[; dkj.k gA ekuo fØ;k&dykik o vR;f/kd yyp d dkj.k ikdfrd lEink dk vR;f/kd nkgu %vkoj ,DliykBV"ku% tur ik/kk dh itkfr;k d

u"V gku dk dkj.k gA ckgjh ; k fon'kh tUr o ikni i tkfr; k dk fcuk fd l h mnn'; l , d {k= e io'k djuk Hkh to fofo/krk dk {kfr inku djrk g t l dN ,fy;u ,DtKfVd eNyh t l ukby ip d vku l fppfyM eNfy;k dh i tkfr;k foylr gku yxh gA bl h idkj xktj ?kk l ¼ikfFku;e½ yUVvuk] ty dEHkh ¼okVj gk;f l Ud½ }jkj gekj n'k dh LFkkfud ?kk l dh ey i tkfr;k dk ud l ku gk jgk gA bl h idkj eRL; ikyu d mnn'; l vYhdu dvfQ" k dyfj; 'k xjhikbul eNfy;k dk gekjh ufn;k e yk;k x;k yfdu ; eNfy;k gekjh ufn;k dh ey dvfQ'k d fy; [krjk cu x;h gA tc ,d i tkfr foylr gkrh g rk m l d l kFk m l ij vk/kkfjr tUr o ikni i tkfr;k Hkh foylr gkrh ; k iHkkfor gkrh gA Hkkjr e e<d juk fvxfjuk dk vR;f/kd fu;kr dju l ePNjk rFkk eyfj;k dk idki c< jgk g D;kfd e<d ePNj d ykok dk [kkrk gA ,d i tkfr d [kRe gku l n l jh i tkfr dh vf/kdrk e deh gk tkrh gA to fofo/krk lk;koj.k dk thou l gk;d fl lVe gA to fofo/krk dk ,Dl l hV o bu l hV l j{k.k }jkj l jf{kr fd;k tkrh gA cktiy e gku okyk iFoh l Eeyu pvFk l feVp to fofo/krk l Eeyu to fofo/krk l j{k.k d fy; gh vk;kftr fd;k x;kA to fofo/krk l f/k l Eeyu jk"Vh; to fofo/krk ikf/kdj.k to fofo/krk l j{k.k vf/kfu;e ck;kMkbof l Vh ,DV 2002 e ikfy;keV l i k l gvA 22 eb fo'o to fofo/krk fno l euk;k tkrh g rFkk o"k 2010 dk vUrj"Vh; to fofo/krk o"k ?kkf"kr fd;k x;kA ; l Hkh to fofo/krk d fy; cuk; x; gA iFoh ij thou dh fofo/krk gA to fofo/krk idfr dk og vx g ft le fd l h i tkfr d vyx&vyx l nL;k e thu dh fofo/krk 'kkfey gA

mRrjk[k.M d dN e[; tho tUr tk foylrhdj.k d dxkj ij g mue mRrjk[k.M dk jkT; i{kh fgeky;u ekuky] jkT; l k'k dLrjh ex ¼eLd fM;j½ jkT; eNyh xkYMu egk l hj] jkT; o{k cjk l ¼jkgkMkMuMku½ o jkT; i"l cge dey gA cgr l vk"l/kh; ikni o tUr t l ,yhQUV] fyim] Vkbxj] xkYMu bxy] fdx dkcj] Hkkj] ?kkjy] cvj flykb] Luk yim] vtxj vkfn dk foylrhdj.k dk [krjk cuk gv k gA budk ekju] f'kdj dju ij oL; tho l j{k.k vf/kfu;e 1972 d vul kj 3&7 l ky dh l tk o vFk n.M gA ikdfrd vkinkvk t l & HkdEi] ckny foLQV ¼DykmM cLV½ e?k xtu] oukfXu] QkjLV Qk;j] [kuu] ck<] Me fuek.k] l Md fuek.k] fMQjLV'ku txy d dvkoj Xykcy okfex o iLVh l bM }jkj Hkkjh ek=k e ouh; iM&ik/k] l {e tho&tUr o mud vkok l u"V gk tkr gA oreku e gh mRrjk[k.M rFkk tEe d'ehj e vkb Hkh" k.k =k l nh ikdfrd vkink dk ge Hkyk ugh ik;A

Xykcy okfex d dkj.k iorh; fge ¼ekmUVu Luk½ o cQ dh pVVku VV jgh gA fgeun ; k Xyf'k; j u"V gk jg gA cQ fi?kyu l Luk ykbu fgej [kk ihN gv jgh g] len ry dk Lrj c< jgk g o tyok; ifjoru gk jgk g ft l l len o ekmuVu bdkf l lVe dh mRikndrk rFkk to fofo/krk iHkkfor gk jgh gA mRrjd'kh dk o : .kkor ior bldk Toyr mnkgj.k gA bldk l /kkju d fy; ge vke turk d l kFk feydj dk; djuk pkfg,A bld fy; lk;koj.k l j{k.k} f'k{kk vul /ku] icU/ku] tutxj.k jyh] tkx:drk rFkk l txrk inku djuk] vUrj"Vh; rFkk jk"Vh; fno l euk] vf/kd l vf/kd iM yxkuk] lk;koj.k /ke dk ekuuk o fo'o Lrjh; l g;kx djuk vko';d gA lk;koj.k fno l] to fofo/krk fno l] fgeky; fno l] vktku fno l] fpidk vihdk vkUnkyuk dk ble cMk egRo g t l - 21 eksp fo'o oL; fno l] 22 eksp fo'o ty fno l] 22 viy iFoh fno l] 22 eb fo'o to

fofo/krk fno l] 5 tu] fo'o lk; koj.k fno l] 11 tykb tul[; k fno l] 9 fl rEcj ior fno l] 16 fl rEcj vk tku fno l] 0k" 2010vUrjk"Vh; to fofo/krk fno l vkfnA

Hkjr t l fodk l'khy n'k e Åtk o lk; koj.k l j{k.k rFkk lrr fodk l d fy, dfBu ifjJe] Vfux] lg; kx&Hkxhnrkj] fj l kbd fyx] fjM; l o fj; t }kj k l l k/kuk dk mi; kx] lk; koj.k /ke o l k] iou o ty Åtk dk viukuk vko'; d gA mRrjk[k.M jkT; e HkdEij k/ kh edku cuku pkfg, rFkk HkL[kyu] iorh; <ky o [kuu oky {k=k e cflr; k] vkok l o lk; Vd foJke xg ugh cuu pkfg, A iorh; <kyk ij o{kj ki.k o Me cukdj dj enk o pVvkuk dk f[k l du l cpk; k tk l drk g rFkk ty fo l r ifj; ktuk, yxkdj fo l r Åtk inku dh tk l drh gA Bk l vif'k"V inkFk dkp] lykLVd ckr] ikyhFku] fMcc] ?k j y dpj k] fVu] lyV] V k; j] byDVkfud l eku] gkfLiVy] oLV] fcfYMX efVfj; y] er l k'k] ddky] vk l kfxd vif'k"V inkFk dk mfpr icU/ku gkuk vko'; d gA miHkDrokn o tul[; k e of) dk jkduk pkfg, rFkk lk; koj.k ufrdrk] lk; koj.k /ke o v k"koknh fopkj/kkj k gkuh pkfg; A cPpk dk tUe l gh lk; koj.k d ifr tkx: d cuku d fy, tu tkxj.k jy h] tkx: drk vfHk; ku] lk; koj.k vf/kfu; e] lk; koj.k f'k{k] lk; koj.k l xk"Bh] lk; koj.k fno l] l l rkg rFkk o"kk dk vk; k t u djuk pkfg, A

InHk

- 1- dek j] , l o % vk tku ir d fo?kVu d tfod iHkkoA ifj; k tuk fji kV] ; dkLV ngj knu] 20&35] %2009%A
- 2- dek j] , l o % mRrjk[k.M jkT; dh fgy LVhe eNfy; k e l kyj vYVkok; yV jfM, "ku rFkk idk" k fo'kkDr j l k; uk ij v/; ; uA ; 0 t h o l h o ifj; k tuk fji kV] 30&42] %2012%A
- 3- dek j] , l o] feJk] i h o o noh] , l o % bfM; u t juy , D l i j heVy ck; ky k t h] 47] 906 %2009%A

मानव-वन्यजीव संघर्ष को न्यूनतम करने हेतु परिवेश तथा पर्यावरण में सुधार करना अनिवार्य है।

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mRrjk[k.M jkT; e yxHkx 65 Qhlnh HkHkx ouk dh gjhfrek l vkPNkfnr g tgg fujUj c<r tk jg ekuo oU; tho l?k"u vke turk d l kFk&l kFk jkT; ljdkj dk Hkh l kPku dk foo'k dj fn; k gA, lh fodV ifjfLFkfr; k fcxMr g, i; koj.k dk gh ifj.kke gA vkt dy lep fo'o e i; koj.k l j{k.k dk ydj fpUr c< jgh gA dgh o'fodm'ehdj.k %Xykcy okfex½ rk dgh fge; x dh oki l h t l cM fo" k; xgu ppkvk dk fcn cu g, gA exj LFkkuh; Lrj ij viu&viu ifjo'k dk l/kkju d i; k l k dh vkj 'kk; n gh fd l h dk /; ku gA ; kn jg fd gekj vki l k l d LoPN jgu ij i; koj.k l l EcU/kr vk/kh l EkL; , rk viu vki gh gy gk tk; xhA ; g cgn fprk dk fo" k; cu pdk g fd bl h vge igy dh vc rd vun[kh gk jgh gA i; koj.k e l/kkj dju d fy, ekuo dk viuh ekuf l drk e cnyko yku dh vko'; drk vku iMh gA

mRrjk[k.M jkT; lep l l k j e to fofo/krk d ekey e cgr /kuh gA ; g jkT; iR; d o" k yxHkx 33 g tkj djkm : lk; dh ifjfLFkfrdh; lok, n jgk gA ble ek= txyk l gh 11000 djkm : i; dh lok, l fEEKfyr gA bl dk , dne l k Q&l k Q vFk g fd ikdfrd l l k/kuk l gh ge cM Lrj ij i; koj.k lok, yxkrkj miyC/k gk jgh gA ; gk /; ku nu ; kX; ckr g fd] geu viu ikdfrd l k l k/kuk dk c<x : l k l nkgu djuk tkjh j[kk g tk gekj vflRro d fy, [krj dh ?k.Vh gAouk dk vU/kk/kU/k dVku rFk [kfut l E ink dk vfu; f=r fonkgu vuor : i l tkjh gA bl h dkj.k iorh; {k=k e ik : % HkL[kyu rFkk fouk'kdkih ck<vku dh ?kVukvk e of) gk jgh g i; koj.k e 0; ki d Qjcny n[ku dk fey jg gA jkT; e l [kk iMu] vR; f/kd o"kk iMuk] Hkjh cQckjh gkuk] fgeunk dk fi?kyuk] d f" k ; kX; Hkfe dk fleVr tkuk] 'kgjhdj.k dk c<uk] t l vud enn i; koj.k e v l URkYku mRiUu dju d dkj.k cu x; gA , lh l Hkh ToyUr l eL; kvk dk fuLrkj.k vke turk d }kj k LFkkuh; Lrj ijgh dju d i; k l dju pkfg, A i; koj.k dk l j{k.k djuk ge l cdh ftEEknkjh gA vke ykxk dk viu&viu vkok l k d i; koj.k dk l k Q o LoPN j[kuk pkfg, A

bl d fy, loiFke ikyhFkhu l fufer oLrvk dk i; kx , dne cUn dj nuk pkfg, rFkk ikyhFkhu dh Fkfy; k dk b/kj&m/kj Hkh ugh Qduk pkfg,] D; kfd , l k dju l 'kgjk rFkk xkok dh ukfy; k i k; % cUn gk tkrh gA ckn e ; gh dMk dj dV uky e i okfgr gkdj ufn; k d ty dk Hkh inf"kr dj nrk gA Hkfe dh mojk'kfDr ij Hkh ikyhFkhu dh oLr, ifrdy iHkko MkYrh gA ?kj k d vki l k l dh gfj; kyh dk cjdj k j[ku d fy, tfod rFkk vtfod dpj d i cU/ku e Hkh ; kx nku ykxk dk nuk pkfg, A , l gh NkV&NkV dne k dk mBku l gh i; koj.k d l j{k.k e cgr l gk; rk i k l r gxhA [kkyh Hkfe ij o fkk dk jki.k djuk pkfg, A ekuo dk viuk vflRro cpku d fy, idfr d fu; ek l c/k dj jguk gh gkxk A ekuo oU; tho l?k"ki

mRRjk[k.M e ekuo oU; tho l?k"ki cgr fpUruh; gn rd c< x; k gA [krjukd <x l c< jg bl }Un e ekuo rFkk oU; tho&nkuk dk gh viuh tku n dj dher pdkuh iM jgh gA jkT; d xBu l ydj vc rd oU; thok d geyk e yxHkx 500 ykxk dh tku tk pdh g] vkj

1000 I T; knk ykx ?kk; y Hkh dj fn; x; g] rk nIjhrjQ yxHkx ,d g tkj oU; tho t l Vkbxj]xynkj] gkFkh dk Hkh ekuok }kjk ekjk tk pdk gA igkMh {k=k rFkk enkuh vpyk nkuk gh LFkkuk ij ekuo&oU; tho I?k" k rth d l kFk c< jgk gA dgghgkFkh [krh dh Qlyk dk Hkkjh ud l ku igpku d l kFk ekuo thou Hkh yhy jg g] rk dgh Vkbxj] rUnvk vkj Hkky Hkh bu l kuk dk ekj jg gA jkT; Ijdj u ekuo oU; tho I?k" k jk dFkke fu; koyh 2012 dk Lohdrh inku dj nh gA ble oU; tho }kjk fd; tku okyh tku eky dh {kfr dk e/; ut j j[kr g, evkott dh jk'kh e c<krjh dju d l kFk&l kFk mldk fu/kkfjr le; & lhek d vnj Hkxrku dju dh Hkh O; oLFkk dj nh gA iju r lcl cMk loky rk ; g g fdft l ifjokj d fpj kx ; k dekÅ ir dk fd l h oU; tho u ekj Mkyk gk rk ml dl oU; tho d l j{k.k d fy, ifjr fd; k tk; xkA bl hfy, ekuo&oU; tho I?k" k dk Fkkeu d fy, mu l Hkh dkj.kk dh t k p iMrky djd mudk fuokj.k djuk cgr vko'; d dke gk x; k g ftudh otg l ; g l?k" k vR; r fprktud Lrj rd igp x; k gA

mRRkj[k.M e fo'k"kdj xynkj d Hkk tu rU= e Hkkjh vLkUryu dh fLFkr mRiUu gk xb gAb l d i l Unhnk vkgkj e & phry]dkdM] ?kjM]yxj cUnj rFkk [kjxk'k vkr gA oreku le; e iorh; ouk e 'kkdkgkj h oU; thokdh l [; k e cgr deh gk xb gA xko okyk rFkk rLdj k }kjk ek l [kkyk gr 'kkdkgkj h thok dk cjgeh l dRyvke tkjh gA vxj rUnvk dk mldk idfr inRr vkgkj ugh feyk rk og D; k [kk; xkA txyk e [kku gr 'kkdkgkj h thok dh fdYyr d pyr gh xynkj u ekuo cflr; k dh vkj vkuk vkjEHk dj fn; k gAo ogk<kjk&Mxjk d cNMk rFkk ikyr HkM cdfj; k] dRRkk dk ekju vkt gA , l gh vud voljk ij mudk ekuo d l kFk }Un gkuk vfuok; gk tkrk gA , l }Unk dk vUr vkerkj ij ekuo thou tkuij gkrk gA txyk e 'kkdHkkt h oU; thok dh tul [; ke c<krjh gr mik; ou foHkx dk dju pkfg, A iorh; {k=k e rUnvk dh c<rh gb l [; k ij Hkh iHkko fu;=.k dju dk le; vk x; k gA mudk idM dj fd l h vU; oU; {k= e foLFkkfir djuk pkfg, A xkeokfl ; k dk Hkh oU; tho {k= e ugh tkuk pkfg, A xko e ?kjk d gh vUnj 'kkpky; k dk fuek.k djuk pkfg, A

; g rF; fd l h Hkh ekuo l fNik ugh g fd to fofo/krk d fy, mRRkj[k.M l kj fo'o e cgr J"B LFkk u j [krk gA ft l dkj.k mldh nfu; k e fof'k"V igpku cu pdh gA vr% ouk d l kFk&l kFk oU; thok dk l j{k.k djuk Hkh vfuok; gA blfy, , l h xfrfof/k; k dk c<ku dh t : jr vku iMh g ftudkd; kUouekuo rFkk oU; tho nkuk dk fy, ykHknk; h gkAouk e eu"; k dh n[kyvUnk t h dk U; ure Lrj ij j [kuk gkxk vkj oU; thok d LoPNUn fopj.k dju d fy, xfy; kjk dk Hkh [kkyuk pkfg, A ge fodkl d l kFk&l kFk txyk d l kFk cgrj leUo; LFkkfir j [kr g, Hkh Bk l j.kuhfr cukuh pkfg, A , l k dju l ekuo&oU; tho I?k" k dk Hkh U; uRke Lrj ij j [kk tk l drk gA

**ग्लोबल वार्मिंग से है खतरे में जान ।
पर्यावरण की रक्षा करना सबकी शान ।**

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वृक्ष की व्यथा

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Email: jvikramnath44@gmail.com

Mobile No: 9761-932-648

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Quarterly News

“प्रजनन केन्द्र पिंजौर से उड़ान भरेंगे ढाई सौ गिद्ध”

- हरियाणा की प्रमुख वन संरक्षक ने रामनगर में दी जानकारी
- गिद्ध संरक्षण के लिए वनाधिकारियों से मांगा सहयोग

संवाद सहयोगी, रामनगर : देश में विलुप्त होने के कगार पर पहुंच चुके गिद्धों की संख्या बढ़ाने की कवायद तेज हो गई है। अब पंचकुला जिले के पिंजौर स्थित गिद्ध प्रजनन केन्द्र से ढाई सौ गिद्धों को खुले आसमान में छोड़ा जायगा। यह जानकारी हरियाणा की प्रमुख वन संरक्षक डॉ. अमरेन्द्र कौर ने रामनगर में वन विभाग के अधिकारियों की बैठक के दौरान दी।

कॉर्बेट निदेशक कार्यालय में हुई बैठक में हरियाणा राज्य की प्रमुख वन संरक्षक डॉ. कौर ने कहा कि देश में 99 फीसदी गिद्ध समाप्त हो चुके हैं। उनके संरक्षण के लिए अब ठोस प्रयास शुरू करने की जरूरत है। उन्होंने गिद्धों की तेजी से घटती संख्या के लिए डाइक्लोफेनिक दवा को मुख्य वजह बताया। कहा कि इस पर रोकथाम में सहयोग के लिए केमिस्ट का रोल अहम है। उन्होंने दवा विक्रेताओं को इस दवा की बिक्री पर रोक लगाने के लिए प्रेरित करने पर जोर दिया। उन्होंने बैठक में गिद्ध संरक्षण के लिए पिंजौर में बनाए गिद्ध प्रजनन केन्द्र के उद्देश्यों की जानकारी भी दी। कहा कि पिंजौर में गिद्धों को संरक्षित करके उनका प्रजनन कराया जाता है, ताकि उनकी संख्या बढ़ सके।

उन्होंने बताया कि वहां से अब ढाई सौ गिद्धों को छोड़ने की कवायद की जा रही है। इन गिद्धों के पैरों में टैग लगाया गया है। चूंकि गिद्ध सौ किमी की परिधि तक उड़ान भरता है। हरियाणा से उड़कर वह उत्तराखण्ड, हिमाचल प्रदेश, पंजाब व यूपी के जंगल में अपना बसेरा बना सकता है। लिहाजा यहां के वनाधिकारियों की जिम्मेदारी बढ़ जाती है कि वह इन गिद्धों के संरक्षण के लिए ठोस प्रयास सुनिश्चित करें। बैठक में पिंजौर गिद्ध संरक्षण केन्द्र के वैज्ञानिक विभु प्रकाश, धनंजय मोहन, कॉर्बेट टाइगर रिजर्व के निदेशक समीर सिन्हा, उपनिदेशक साकेत बडोला आदि मौजूद रहे।

क्या है डाइक्लोफेनिक दवा

मई 2008 से पशुओं की दर्द निवारक डाइक्लोफेनिक दवा का उत्पादन एवं वितरण भारत में प्रतिबंधित है, लेकिन इंसानों में प्रयोग होने वाली डाइक्लोफेनिक दवा प्रतिबंधित के दायरे से बाहर है। इंसानों वाली डाइक्लोफेनिक दवा की डोज बढ़ाकर पशुओं में अभी भी इस्तेमाल की जा रही है। ऐसे पशु की मौत होने पर जब गिद्ध उसे खाता है तो उसका पाचन तंत्र बिगड़ जाता है उसकी किडनी फेल हो जाती है। जिससे गिद्ध की मौत हो जाती है।



Society's News

Every year Wildlife Preservation Society of India a non-Government organization working for preservation of wildlife in India and a leading NGO of Dehradun is sponsoring silver medal for the officer trainee of Post Graduate diploma in Advanced Wildlife Management conducted by Wildlife Institute of India, Dehradun. This silver medal is awarded to officer trainee who secure second position in merit (Second highest aggregate marks in all modules including field exercise).

During this year the XXXVII PG Diploma course valedictory function was organized on 30th June at Auditorium of Wildlife Institute of India and Dr. Nandini Salaria received Wildlife preservation society Silver Medal for the second in order of merit.



Dr. Nandini Salaria receiving Silver medal sponsored by Wildlife Preservation Society of India

यूकॉस्ट के विज्ञान धाम में पौधरोपण

देहरादून। उत्तराखण्ड राज्य विज्ञान एवं पौद्यौगिकी परिषद 'यूकॉस्ट' के झाझरा स्थित विज्ञान धाम में पौधरोपण हुआ। यूकॉस्ट के साथ राष्ट्रीय विज्ञान अकादमी और वाइल्ड लाइफ प्रिजरवेशन सोसायटी ऑफ इंडिया की ओर से रुद्राक्ष, अशोक, जामुन, कनेर, नींबू और आम के 300 पौधे रोपे गए। यहां पर्यावरण पंत्रालय के विशेष सचिव डॉ. एसएस नेगी वाइल्ड लाइफ प्रिजरवेशन सोसायटी ऑफ इंडिया देहरादून के नरेंद्र सिंह, डॉ. प्रशांत सिंह, पंकज शाह, यूकॉस्ट महानिदेशक डॉ. राजेन्द्र डोभाल आदि शामिल रहे।

(हिन्दुस्तान, जुलाई 31, 2016)



UCOST, NASI Uttarakhand Chapter, WPSI organizes Tree Plantation Program

Uttarakhand Council of Science and Technology (UCOST), National Science Academy Uttarakhand Chapter and Wildlife Preservation Society of India (WPSI) jointly carried out a tree plantation at Vigyan Dham premises in Jhajhra here today. More than 300 saplings were planted and resolved to take care of them in the future. Mainly saplings of Rudraksh, Jamun, Kaner, Lemon and Mango were planted along with Bamboo in a specified place.

Chef Guest Dr. SS Negi Director General and Special Secretary, Forest and Environment Ministry, Government of India, said that trees were very useful for the human life. He underlined the usefulness of trees for the environment. Narendra Singh from WPSI, Dr. Prashant Singh and Pankaj Shah apprised about the activities of the Society and wished UCOST good luck for the tree plantation program. DG UCOST Dr. Rajendra Dobhal extended gratitude towards the guests and members and said that the Council was also going to develop a Biodiversity Park at Vigyan Dham premises which would possibly complete by June 2017.

The saplings were planted by scientists of FRI members of WPSI and UCOST.

LIST OF LIFE MEMBER (2016)

- | | |
|--|--|
| 1. DR. NEERJA SINGH
14, MUNICIPAL ROAD,
DEHRADUN. | 2. CAPT. RAKSHIT SHARMA
F2524, PALAM VIHAR,
GURGAON, HARYANA. |
| 3. DR. CAPT. ALOK SHARMA
FALCON CREST, KEWAL VILLA,
ADHUIWALA, SHASTRADHARA ROAD
UK-248001. | 4. MR. SANDEEP SHARMA
57/2, RAJPUR ROAD,
DEHRADUN. |
| 5. MR. RAGHVENDRA SINGH
12/2, LAXMI ROAD,
NEAR SALES TAX OFFICE,
DALANWALA, DEHRADUN, U | 6. MR. ATENDRA SINGH
19-E, SUBHASH ROAD,
DEHRADUN. |
| 7. DR. BHARAT PATIL
PATIL IMPLANT, ASTLEY TOWER,
DEHRADUN | 8. DR. TARUN SHARMA
68/1, RAJPUR ROAD,
OPP. MADHUBAN HOTEL,
DEHRADUN. |
| 9. MR VISHNU SHARAN RASTOGI
4 A, DWARKA TOWER, JAGRITI
VIHAR, MEERUT (U.P.) | 10. MR. SANJAY SAKLANI
100, TAGORE VILLA
DEHRADUN |
| 11. MR. DEEPAK KUMAR GUPTA
92, SUMANPURI, RAIPUR ROAD
DEHRADUN | |

ANNUAL MEMBER (2016)

- | | |
|--|---|
| 1. MR. MANISH DEV
MONORAYS CYBERNETICS
28, MANSINGHWALA,
DEHRADUN | 2. MR. VIVEK SENGAR
786, BRAHAM NAGAR
NEAR KATH GODOWN
AURAIYA-206122 (U.P.) |
|--|---|

N KUMAR GUPTA & ASSOCIATES
CHARTERED ACCOUNTANTS

THE WILD LIFE PRESERVATION SOCIETY OF INDIA

Heritage Apartments, New Road,
Dehradun

BALANCE SHEET AS AT 31/03/2016

LIABILITIES	AMOUNT	ASSETS	AMOUNT
Capital Fund	255,086.00	<u>FIXED ASSETS</u>	4,245,896.00
Corpus Fund	5,000.00	<u>INVESTMENTS</u>	
General Fund		FDR's with PNB	
Opening Bal	12,213,855.19	FDR No.11905	5,000,000.00
Add:- Current Year Surplus	<u>743,502.02</u>	FDR No. 09162	74,023.00
	12,957,357.21	FDR No. 12029	48,593.00
Building Fund		FDR No. 69167	64,061.00
Building	4,129,461.00	FDR dated 31.07.2015	<u>5,200,000.00</u>
Fixed Assets Fund			10,386,677.00
Fixed Assets	104,635.00	Accrued Interest on FDR'S	
		Last Balance	1,449,988.00
		Add:- Interest accrued during the year	<u>527,734.00</u>
			1,977,722.00
Current Liabilities		<u>CURRENT ASSETS</u>	
Accounting Charges Payable	20,000.00	Cash & Cash Equivalent:	
Audit Fees Payable	22,800.00	Cash in hand	17,953.00
Sundry Debtors	5,423.00	PNB S/B A/c: 0111000100650780	<u>729,836.21</u>
Legal Expenses Payable	<u>2,247.00</u>		747,789.21
	50,470.00	TDS Receivable	
		TDS (A.Y. 15-16)	58,432.00
		TDS (A.Y. 16-17)	<u>85,493.00</u>
			143,925.00
Total Rs.	17,502,009.21	Total Rs.	17,502,009.21

(Secretary)

(Treasurer)

(President)

Place : DEHRADUN
Dated : 23 MAY 2016

As per our separate report of even date

For N.KUMAR GUPTA & ASSOCIATES
CHARTERED ACCOUNTANTS

(NAVEEN K.GUPTA)
FCA



N KUMAR GUPTA & ASSOCIATES
CHARTERED ACCOUNTANTS

THE WILD LIFE PRESERVATION SOCIETY OF INDIA

Heritage Apartments, New Road,
Dehradun

INCOME & EXPENDITURE A/C FOR THE YEAR ENDED 31/03/2016

EXPENDITURE	AMOUNT	INCOME	AMOUNT
To Accounting Charges	20,000.00	By Membership Fee	
To Audit Fees	22,800.00	Annual Fees	6,700.00
To Bank Charges	182.98	Life Membership Fees	117,000.00
To Books & Periodicals	2,348.00	Students	600.00
To Advertisement	1,700.00		124,300.00
To Conveyance Charges	2,100.00	By Interest on income tax refund	6,428.00
To Bonus	1,000.00		
To Electricity Expenses	2,774.00	By Intt on Saving Bank's A/c	46,404.00
To Net Expenses	2,430.00		
To Miscellaneous Expenses	1,850.00	By Interest on Capital Gain Bonds	49,521.00
To Office Expenses	24,855.00		
To Postage & Telegram	5,231.00	By Intt on FDR (Acc.)	867,000.00
To Printing & Stationary	62,699.00		
To Repairs & Maintenance	78,750.00	By Miscellaneous Receipt	13,287.00
To Salary	105,310.00		
To visiting Expenses	4,375.00		
To water Expenses	10,950.00		
To Website Development Charges	2,500.00		
To Telephone Expenses	11,583.00		
To Surplus	743,502.02		
(Being excess of Income over Expenditure)			
Total Rs.	1,106,940.00	Total Rs.	1,106,940.00

(Secretary) (President) (Treasurer)

As per our foot note on Balance Sheet of even date

For N.KUMAR GUPTA & ASSOCIATES
CHARTERED ACCOUNTANTS

(NAVEEN K GUPTA)
F.C.A.



Place : DEHRADUN
Dated : 25 MAY 2016

N KUMAR GUPTA & ASSOCIATES
CHARTERED ACCOUNTANTS

The Wild Life Preservation Society of India
Accounting Policies And Notes On Accounts
As on 31st March 2016

Significant Accounting Policies:-

1. Accounting Conventions:-

The financial statements have been prepared in accordance with mandatory Accounting Standards issued by the Institute of Chartered Accountants of India. The Society follows accrual system of accounting & recognizes Income and Expenditure accordingly.

2. Fixed Assets:-

Fixed Assets are carried at cost of acquisition or construction and include inward freight duties, taxes and incidental expenses related to such acquisition.

Fixed Assets are shown at book value and have not been revalued during the year. The record of fixed assets including movable and immovable property is maintained. Random physical verification of fixed assets has been done by the management during the year and no material discrepancy is reported.

3. Taxation:-

No provision has been made for income tax as the Income of the society is exempt U/s 11(1) of the Income Tax Act, 1961.

4. Recognition of Income & Expenditure:-

Revenue is recognized and expenditure is accounted for on accrual basis.

Annexed to the Audit Report of even date

For M/S N.Kumar Gupta & Associates
Chartered Accountants

(Naveen K. Gupta)
F.C.A



Place: Dehradun
Date: 25 MAY 2016

The Wildlife Preservation Society of India

Patron:

Mr. Ravi Singh, CEO & Secretary General, WWF-India, New Delhi.
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The Wildlife Preservation Society of India

1. The aims and objects of the Society are as follows :-

- (a) To promote interest and impart knowledge regarding the preservation and conservation of all forms of wildlife, particularly among the youth of the country.
- (b) To cooperate with the Govt. of India and State Governments and with others Societies and Institutions having similar aims and objects in working for the interests of wildlife.
- (c) To assist in enforcing and actively supporting the Forests Acts. Wild Birds and animals Protections Acts and Rules etc. of State Governments and the Indian Arms Act and Rules in so far as they pertain to wildlife and to bring to the notice of the authorities any infringement of the same and to assist in the detention and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wildlife administrators in the formation, maintenance and protection of Sanctuaries and National Parks, preservation of wildlife in general and endangered species of India in particular and in the introduction of exotic species into the country, rehabilitation of endangered species etc. and in the formulation and amendments of rules and acts, so as to conserve and increase wildlife stocks.
- (e) To raise funds for carrying out the above aims and objects and to found and maintain museums reading rooms and libraries of natural history in order to disseminate knowledge regarding wildlife.
- (f) To carry out publicity and propaganda for the preservation of wildlife in India by means of monographs, journals, films, filmstrips and other feasible methods.
- (g) To assist members of the Society in obtaining facilities for viewing and photographing wildlife in India.
- (h) To conduct research into the problem of Wildlife management in India, and in pursuance of this, to initiate, encourage and, where possible assist in the projects of the study of threatened species and related objects and to provide reference and research facilities for such work.
- (i) To carry on such other activities which will serve the above subjects.

2. What membership of Wildlife Preservation Society of India will entitle you to ?

- (1) You will become an active member of the growing group of Wildlife enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of wildlife for posterity.
- (2) You will be entitled to the full use of the library of the Wildlife Preservation Society and of it reading room.
- (3) You will receive a membership certificate.
- (4) You will receive a personal Identification and Membership Card.
- (5) You will be entitled to buy all publications of the Society at a concessional rate.
- (6) You will be entitled to buy at concessional rates the Societies Greeting Cards, Calendars. Tie, Label badges and the Balance of Nature Game (specially Published in colour for its educative and recreational values).
- (7) You will be supplied "Cheetal", the quarterly journal of the society free.

3. For membership particulars write to Honorary Secretary, Wildlife Preservation Society of India Heritage Apartments, Flat No. 2, First Floor, 18, New Road, Dehradun Uttarkhand - 248001.

Guide Lines for Authors

The editors will consider research papers for publications based on the novelty of their immediate or future impact on wildlife (Non-domestic, Terrestrial, Aerial and aquatic animals and plants from monera protista to whale & elephants). Popular articles on wildlife are also welcome.

1. Manuscripts should be written in clear and simple language either in English or Hindi, we publish both and should be typed in double line spacing with wide margins on one side of the paper. Form and content should be carefully checked to exclude the need for correction in proof. Necessary changes will be made in manuscript, if needed. Photographs should be on glossy paper and about post card size.

2. It should start with title of the paper, first name(s) and surname of author(s) institute and footnotes referring to the title to be indicated by asterisks, full address(es) of the author(s), If there are several authors, and places make the affiliation clear.

3. At least one author must be member (Annual or life) of the society at the time of submission of MS. Scientific names should be in italics or underlined. All abbreviations and units of measurement must conform to the international standards.

4. **Summary** : Each paper should be preceded by a summary or abstract. The summary should state what was investigated and what are the findings, and conclusion followed by Introduction. Materials and Methods, Results and Discussion, Reference and acknowledgement.

5. **Key words**: Below the summary or abstracts, upto 5 key-words should be written for subject indexing

6. The list of references should include only works referred into the text. They should be cited as follows:

Research Paper : Names, start with initials of all authors, year, full title, journal as abbreviated in index medicus, volume with number, first and last page numbers.

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8. Short notes or reports of observations on wildlife of special interest will be published. Short communications without headings will be given top priority in the editorial and publication process.

9. In the section, letters to the editor, important and specific problems (also negative results) can be published.

10. Five reprints will be supplied on gratis.

11. Manuscripts should be submitted one hard copy with CD to the editor-Cheetal, Wildlife preservation society of India or email to wpsidoon@gmail.com or drsp Singh1949@gmail.com.



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E-mail : wpsidoon@gmail.com

THE WILDLIFE PRESERVATION SOCIETY OF INDIA

(Established 1958)

Heritage Apartments, Flat No. 2, First Floor, 18 New Road, Dehra Dun. 248001

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I.....
hereby apply to be admitted as a Life / Annual / Affiliated
/ Institutional / Student of the Wildlife Preservation Society of India.
My details are given below:

Name.....

Father's Name.....

Address.....

Phone No. with STD Code.....

Mobile No.....

Whats app No.....

Email

Date of Birth.....

Hobbies and Interest.....

Any Conservation work done.....

I hereby affirm and assure that I shall abide by the rules and regulations and constitution of WPSI. I shall not do anything contrary to the ethics of wildlife conservation and do whatever possible at my end, to uphold the dignity of the society and discharge my duty to save and conserve wildlife and its habitat. I declare that there is no criminal case against me.

Recommended by
(Preferably Life member of WPSI)

1.....
2.....

Applicant's Signature

Approval of member screening committee & comments:

1.....
2.....
3.....

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Brahminy Myna



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Common Myna



Photo by Zaheer Bakshi

Cormorant



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Wiretailed Swallow (Sub Adult)